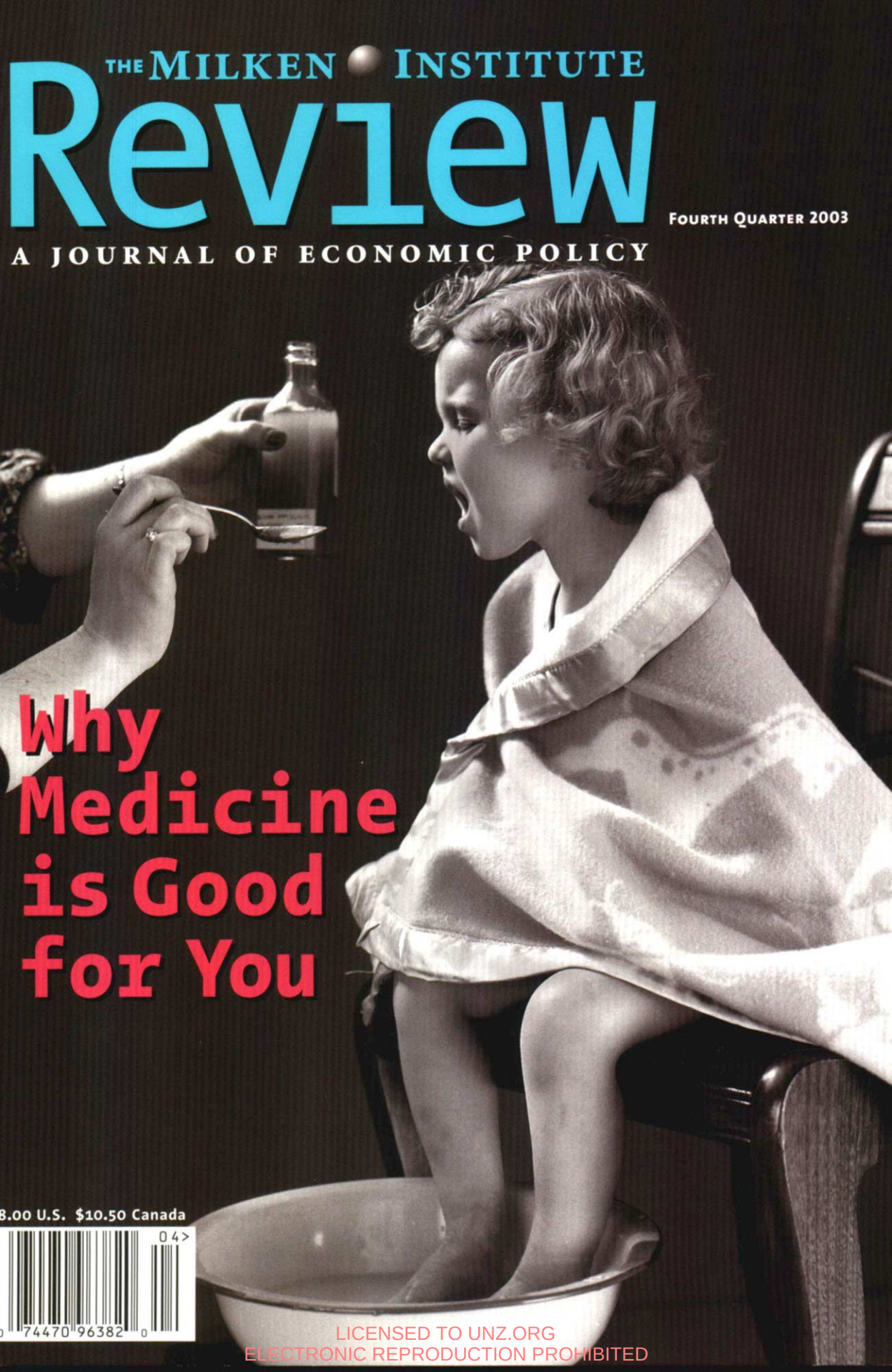
THE MILKEN INSTITUTE

Review

FOURTH QUARTER 2003

A JOURNAL OF ECONOMIC POLICY



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THE MILKEN INSTITUTE REVIEW • FOURTH QUARTER 2003

VOLUME 5, NUMBER 4

THE MILKEN INSTITUTE
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ISSN 1523-4282
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The Milken Institute
Santa Monica, California

The Milken Institute Review is published quarterly by the Milken Institute to encourage discussion of current issues of economic policy relating to economic growth, job creation and capital formation. Topics and authors are selected to represent a diversity of views. The opinions expressed are solely those of the authors and do not necessarily represent the views of the Institute.

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FROM THE PRESIDENT

We're proud of the Milken Institute's ability to bring together individuals with a broad range of experience and ideas, in study areas ranging from health care and financial markets to demography and regional development.

At our public events, as well as through our publications, we draw from a diverse group of thought leaders – economists, business executives, financial analysts, academics, government officials, physicians and many others – to help find solutions for pressing public policy problems. A multitude of viewpoints, we feel, produces a bounty of ideas. This issue of the *Review* includes some of that bounty:

Frank Lichtenberg of the Columbia Business School writes about drug research (see page 16). This article stemmed from his work, "Pharmaceutical Knowledge – Capital Accumulation & Longevity," which was one of three papers to receive the 2003 Milken Institute Award for Distinguished Economic Research (Richard L. Sandor, who created the Chicago Climate Exchange, also received a special award for financial innovations).

This issue's book excerpt is from *Saving Capitalism from the Capitalists*, by Raghuram Rajan and Luigi Zingales. Dr. Rajan recently spoke at a Milken Institute Forum about his book. While cautioning that good government is an essential part of a successful capitalist system, he defended globalization, open trade and free markets as the best way to eliminate poverty.

Michael Bernick, director of the State of California's Employment Development Department, examines strategies for employing the disabled on page 38. He spoke at our recent California State of the State Conference on one of the state's front-burner problems: strategies for training a workforce that will sustain job and income growth.

The *Review* is also notable for its wide range of topics. While the Institute continues to focus on its core areas – ideas that will help create jobs and greater access to capital (see the article on financial innovations by our own Glenn Yago and Susanne Trimbath on page 87) – almost no issue with an economic consequence is beyond our grasp. This includes competition in the business of sports (see Andrew Zimbalist's article, page 56), protection of intellectual capital (Martin Campbell-Kelly, page 26), a report card on the euro (Barry Eichengreen, page 47), and even allocation of the radio spectrum (Tom Hazlett, page 9).

In the next issue, you'll hear more about our newest area of focus – the economics of health care and our Center for Accelerating Medical Solutions. But for now, enjoy the great diversity of authors and ideas that *Review* editor Peter Passell has put together for you.

Michael L. Klowden
President and CEO

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Boreas, the purple-winged god of Winter, brings the North winds once more. The last of the leaves, in faded hues of reds and golds, litter the sidewalks; early morning hoarfrost leaves intricate lattices on the rear windows of cars left overnight in driveways.

Well, maybe where you live. But here in southern California, folks are still sipping caramel macchiatos outdoors, and the 14-year-olds going on 19 are still flashing their navels in front of The Gap. None of these distractions, of course, has stopped our dedicated team from producing (would you believe!) the 20th glorious issue of the *Milken Institute Review.*

Frank Lichtenberg of the Columbia Business School brings good news from the fast-moving world of drug research. "Not only is there strong evidence that the benefits from new pharmaceuticals in terms of longer life and better health in old age far exceed the costs, it appears that drug innovation also yields net savings by reducing demand for other forms of medical care."

Tom Hazlett, a senior fellow at the Manhattan Institute, takes aim at the FCC's indecision in divvying up the radio spectrum for everything from cell phones to Wi-Fi to satellite radio.

"The FCC," he argues, "is caught between an acknowledgement of the compelling need to let markets decide how spectrum is used and an irresistible urge to force the market to accept the Commission's guesses about how spectrum can be used most efficiently.

CRAIG LAROTONDA

Consumers are paying the price for the contradiction."

Martin Campbell-Kelly of the University of Warwick examines growing concerns that the use of patents to protect computer software is undermining innovation and driving the small-fry from the business. "The system for protecting the intellectual property embodied in software is far from perfect," he concedes. "Yet some perspective on the consequences of these imperfections – not to mention the shortcomings of alternative

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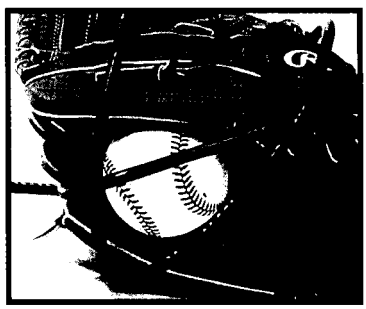
means of protecting software – is needed, lest in the act of reforming the rules we throw out the proverbial baby with the bath water."

Andrew Zimbalist of Smith College brings us up-to-date on the state of greed and avarice in professional sports. Or at least the telecasting side of the business. Zimbalist argues that the vertical integration of professional sports, in which the same folks own teams and sports networks, and exercise considerable leverage over cable television systems, is leaving consumers' interests in the cold.



"What practical steps could be taken?" he asks. "First, the FCC could reverse its current course and begin to promote competition among cable providers in individual markets. This could be accomplished by requiring cable distributors to provide physical local loop access to competitors – as was done in the telephone industry."

Barry Eichengreen of the University of California at Berkeley takes a cool look at Europe's five-year experience with a single currency.

"Americans like to spin tales of the coming collapse of the monetary union," he writes. "But the fact that monetary union is part of a larger European project means that the euro is not going away. The euro union will not be jettisoned simply if it produces uncomfortable economic results, because it is not going to be judged by its members on narrowly economic grounds. That said, anything that the participants can do to make their new monetary arrangement operate more smoothly would be welcome. They should get to work."

Michael Bernick, director of the State of California's Employment Development Department, takes measure of a last bastion of adult dependence – the disabled – and their primary source of income, the Federal Supplemental Security Income benefit program (SSI). "Following welfare reform, the structure of SSI must be far more oriented to employment," he argues. "Long-term SSI receipt should be an option for only a small proportion of recipients, and participation in work placement should be required. The system's current disincentives to work need to be reversed, with work made more financially attractive than SSI."

Susanne Trimbath and **Glenn Yago** of the Institute's own capital market group, speculate about ways to extend the latest financial technology to markets. One prime area: intellectual property. "While the potential inventory of intellectual property and knowledge capital has continued to grow, supplies of capital (public and private) contracted after the stock market meltdown on 2000," they note. "Financial technology can help to close the gap," between actual and optimal investment," they argue, "for example, by pooling and diversifying risk in projects to commercialize inventions."

I'm especially proud of this issue's book excerpt, *Saving Capitalism from the Capitalists*, by **Raghuram Rajan** and **Luigi Zingales**. This sophisticated non-Marxist analysis of capitalism's internal contradictions is a must-read for those of us who fear that Enron, Adephia and the like are harbingers of a system in decline.

And don't forget the Charticle – Milken Institute demographer **Bill Frey**'s latest insights into the U.S. Census.

—Peter Passell

MICHAEL SIPE

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BY WILLIAM H. FREY

A century and a half after the gold rush brought the first flood of Americans seeking the good life in California, the giant sucking sound heard from Maine to Kansas to Oklahoma has finally been silenced.

According to newly released Census figures, three-quarters of a million Americans more left the Golden State in the second half of the 1990s than arrived. While California's population is not shrinking – foreign immigrants continue to pour in – this turnaround marks a sea change in its demographic allure.

The almost universal popularity of California as "America's destination" was evident as late as the 1960s, when it gained more migrants than it lost to 41 other states. The trend continued through the 1970s and 1980s, with large flows from the Northeast and Midwest. But in the 1995-2000 period, California lost more migrants than it gained to 39 states.

Nevada and Arizona proved most attractive. Other Western states, including Oregon, Washington, Colorado and Utah, also gained substantially from California's outflow, as did Southeast magnets including Georgia, Florida and North Carolina.

The early evidence suggested this was a "white flight" phenomenon – a variant of the early 1950s flight to the suburbs. But California's 1990s out-migration proved to be more heavily Hispanic than white. Blacks and Asians also turn up on the loss side of the ledger.

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BILL FREY is a senior fellow in demography at the Milken Institute and a visiting fellow at the Brookings Institution in Washington DC.

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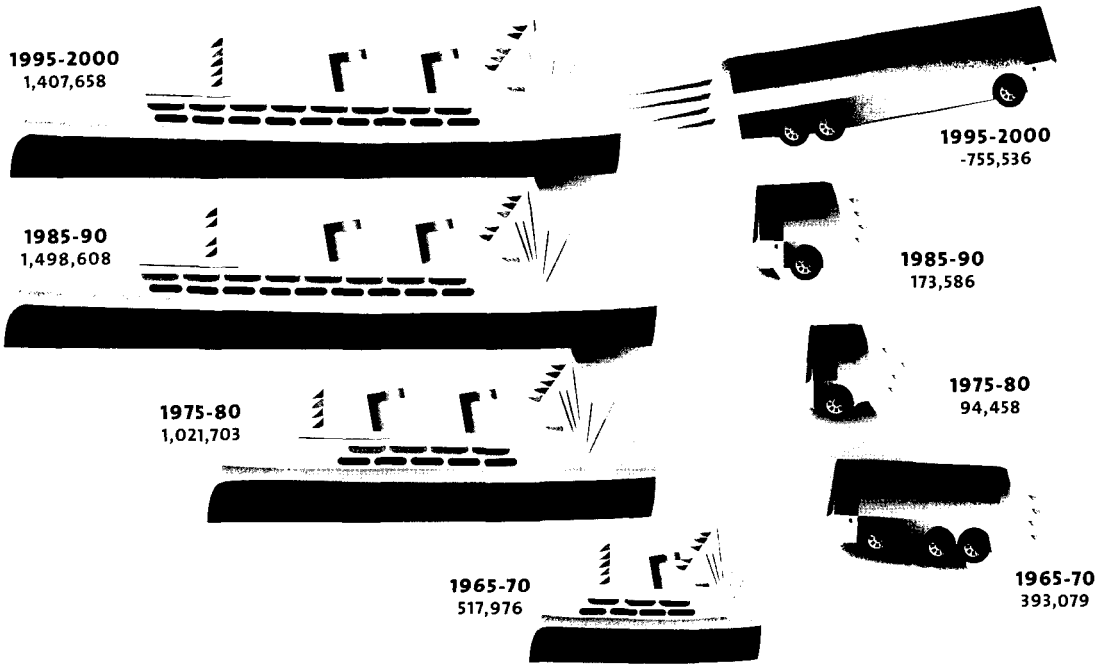
CHARTICLE

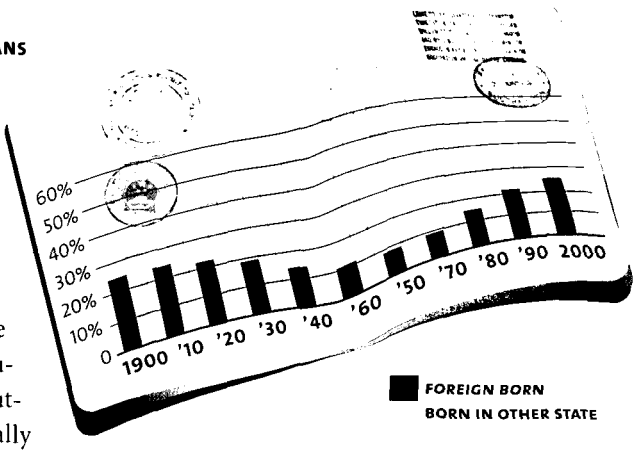
WEST COAST ELLIS ISLAND

IMMIGRANTS AND DOMESTIC MIGRANTS TO CALIFORNIA



GLOBAL GOLD RUSH

MORE NON-NATIVE CALIFORNIANS ARE FOREIGN-BORN



A better label for this movement is "flight of the struggling middle class." Adults with a high school education or less showed the highest out-migration rates; California actually gained college graduates. The state remains a land of promise for well-heeled professionals. But for others, opportunities seemed brighter in lower cost, less congested states in the rest of the West or in the East.

Yet, while California ranked second (to New York) in losing migrants to other states, it ranked first in gaining migrants from

MAX HARLESS AND BRUCE SANDERS (ALL)

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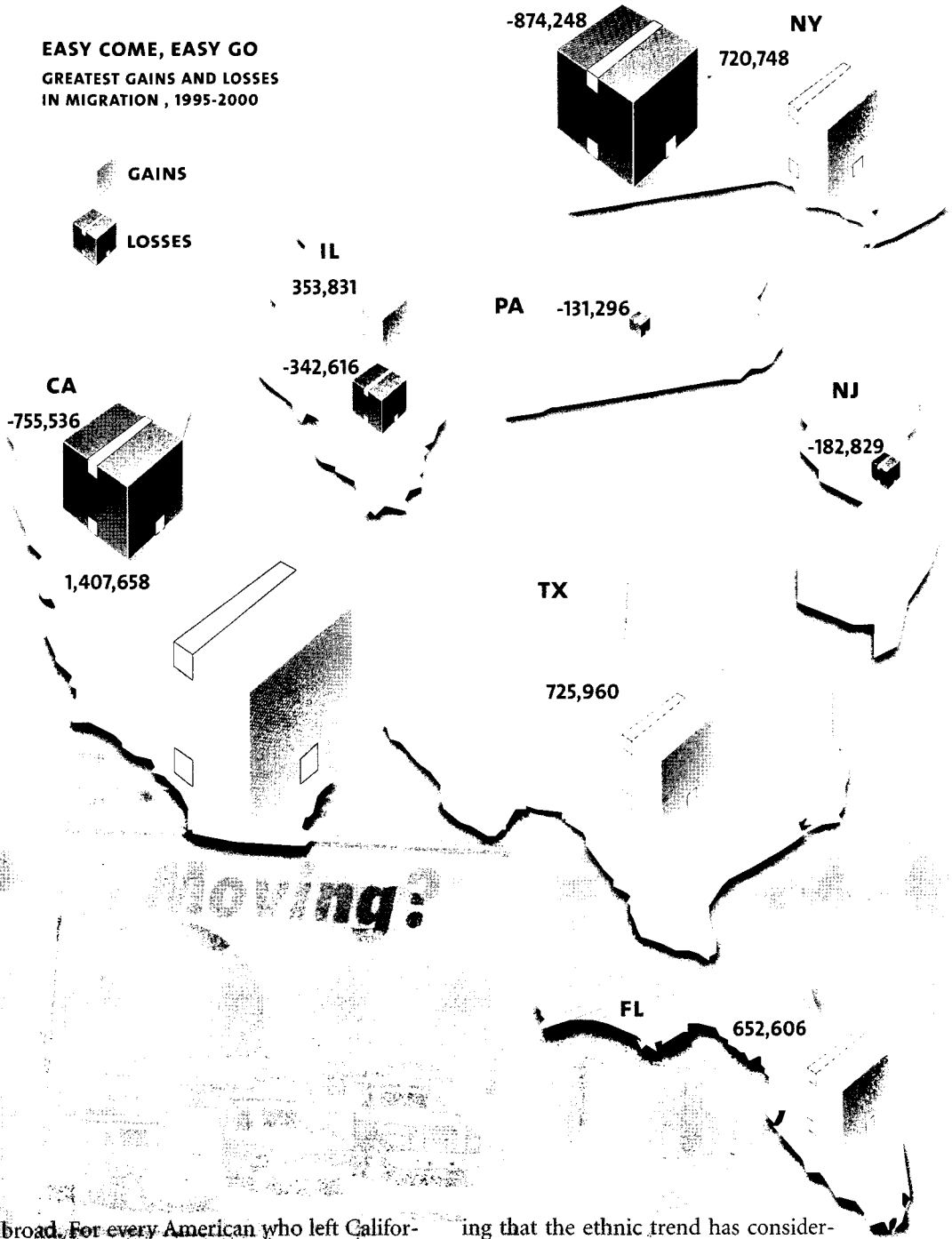

abroad. For every American who left California in the last half of the 1990s, two foreigners arrived. And the children of immigrants are adding to the state's ethnic mosaic.

ing that the ethnic trend has considerable inertia.

The 2000 Census shows that, for the first time, more Californians were born in

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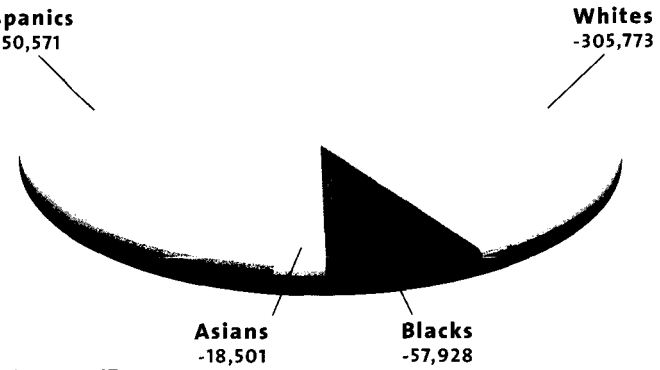
CHARTICLE

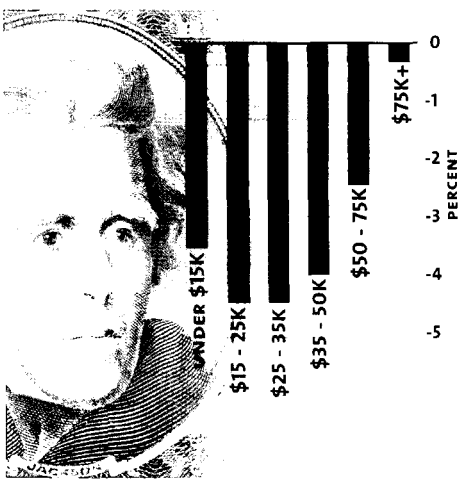
NOT JUST WHITE FLIGHT...

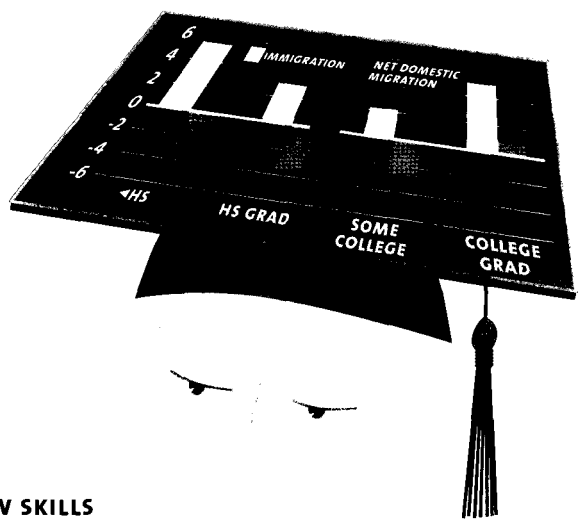
DOMESTIC NET OUT-MIGRATION FROM CALIFORNIA BY RACE, 1995-2000



...BUT MIDDLE CLASS FLIGHT

DOMESTIC NET OUT-MIGRATION FROM CALIFORNIA





HIGH SKILLS, LOW SKILLS

IMMIGRATION AND DOMESTIC MIGRATION RATES BY EDUCATION, 1995-2000

a foreign country than in other US states. This contrasts markedly with the post-World War II decades, when more than half of California's population was born in other parts of America. Now that share has dropped to less than a quarter, while more than a quarter are foreign-born. California remains a land of opportunity, but for very different groups. M

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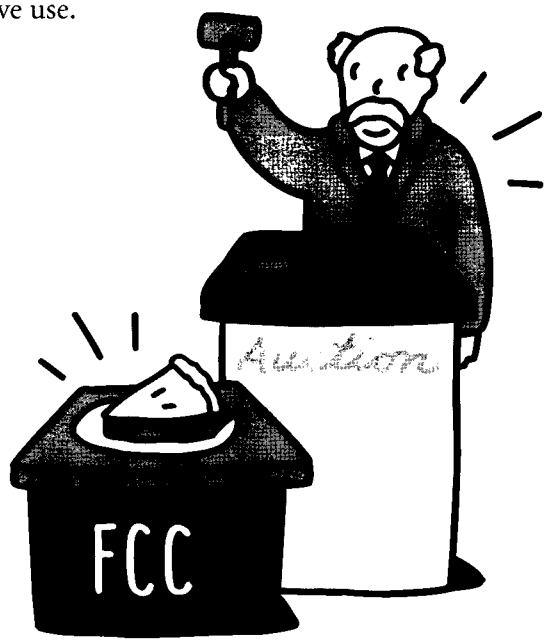
BY THOMAS W. HAZLETT

In 1951, Dallas Smythe, the chief economist of the Federal Communications Commission, dismissed law student Leo Herzel's proposal in the *University of Chicago Law Review* to auction broadcast TV licenses. Chiding Herzel's blissful naïveté, Smythe scoffed that markets could not possibly handle the complex task of coordinating airwave use.

A half century on, the blissfully naïve have switched sides. Today it is obvious to regulators that they cannot fathom the countless shapes and sizes of wireless services, or the potentially limitless configurations of wireless markets. Private entrepreneurs must be unleashed to discover the efficiencies beyond. As the FCC's Spectrum Policy Task Force Report noted last year, "the government has an almost impossible task trying to keep pace with the ever-increasing demand for spectrum and the continuing advances in wireless technology and applications."

From their lips to God's ears. Despite frequent press references to our "crowded radio waves," most of the valuable frequencies are barely used. Rather, it is the lobby of the FCC that is crowded – jam-packed with applicants. It is no anomaly that federal rules keep 67 television channels in reserve for Springfield, Mass., a city with just three TV stations on the air. Indeed, to get a sense of the pervasive misuse of a valuable natural resource, one need only look at the variety of wireless services



STEPHEN SCHUDLICH (ALL)

that petitioners at the FCC would like to deliver to the good people of Springfield by using those idle channels.

Were competitors free to offer any noninterfering wireless service, via any business model at any frequency, the productivity gains would be enormous. Given flexible rights, spectrum licensees would become de facto spectrum owners, and the search for property improvements would be on.

TOM HAZLETT is a senior fellow at the Manhattan Institute for Policy Research and a columnist for the *Financial Times'* New Economic Policy Forum.

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Consumer benefits would run the gamut: better coverage (and fewer dropped calls) on cellular phones, faster (and less expensive) broadband access to the Internet, wireless competition to cable and satellite TV. Perhaps most important are the creative applications yet unknown.

The long march to a consensus among economists was set in motion in 1959 by an influential article in the *Journal of Law and Economics* on the value of making markets in spectrum by the University of Chicago's Ronald Coase, who would later win a Nobel Prize in economics. It took policymakers decades to catch on, but in recent years they have joined the ranks of believers in droves. Two years ago, 37 "concerned economists," including the aforementioned Nobel Laureate Coase, petitioned the FCC to "eliminate all wireless license requirements unrelated to interference or anticompetitive concentration."

Yet, when the Spectrum Policy Task Force reported its findings, the consensus promoting spectrum markets had mysteriously vaporized. In fact, the task force called on regulators to continue to assign spectrum use in much the same way that has deprived Springfield of most of the benefits of the airwaves. While flexibility was endorsed in theory, plans to extend flexible rights to licensees were largely set aside. New emphasis was placed on imposing technical standards on spectrum users – precisely the function best left to free markets.

ALLOCATING SPECTRUM AND ASSIGNING LICENSES

FCC regulation of radio spectrum is a two-stage process. In the first, "block allocation," the Commission decides what specific frequencies shall be used for. Zoning each band, the Commission defines services, prescribes technologies, dictates business models and mandates emission standards. It also determines market structure. If it sets the band aside for unlicensed use, it also controls interference by setting power limits and regulating the equipment permitted. For licensed bands, regulators decide how many firms shall compete and how much bandwidth each licensee shall have.

The Commission then doles out licenses. Since 1994, this has primarily been done via auctions. Through 2002, high bids totaled $41 billion, though, thanks to defaults and legal wrangling, only $14 billion ended up in the U.S. Treasury. The licenses do not convey ownership rights to spectrum. For example, if a company is licensed to deliver satellite radio services, it may not decide on its own to use the spectrum for terrestrial services. The licensee enjoys exclusive use of the allocated bandwidth – but only to operate as regulators specify.

This sharply limits competition. For example, satellite radio operators cannot confront local radio stations with a truly competitive product because they are not allowed to deliver local news or other programs by means of supplementary terrestrial broadcasts. And, no surprise, such rigidities are strongly supported by incumbent licensees.

Potential users must petition the agency to gain a spectrum allocation, proving that their new wireless systems serve "the public interest." The claims are, of course, challenged – and rechallenged – by incumbents bearing lawyers. In the rare case in which an entrepreneur wins FCC support to provide a novel wireless service, he or she wins thanks – but not a license. The innovator must, instead, buy one at auction. In the final humiliation of the upstart, the FCC pockets much of the expected economic profit from new use of spectrum, while rival firms are given an

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opportunity to outbid the innovator and appropriate the business model.

Multiply this maze of roadblocks and disincentives by an order of worldly magnitude. Scores of new wireless technologies are stifled as their inventors struggle to scale regulatory walls; scores more remain undiscovered as economic incentives to research and development are eviscerated. Inefficiencies plague technical progress – for example, Americans view TV pixels arrayed as per the state-of-the-art standard of 1941. Billions of dollars in consumer benefits are lost as U.S. wireless operators utilize just 150 megahertz (MHz) of bandwidth, scarcely half the average allocation in countries of the European Union.

THE TASK FORCE PUNTS

In the Spectrum Policy Task Force Report, the misallocation problem is outlined in standard terms. Curiously, however, new technology is cited as the villain. Until the wonders of the digital era, we are told, demand for spectrum access was low and the old regime worked reasonably well. Now, new rules are needed for new times. Policymakers should understand that "one size does not fit all," and pick their regulatory models with care. Their choices, the report states, are three:

1. Exclusive use, in which a licensee has exclusive, flexible and transferable rights to use specified spectrum. Think cellular telephone services.

2. The commons, which allows unlimited numbers to share frequencies set aside for unlicensed use, with operations restricted through power limits and technical standards, but with no right to protection from interference. Think cordless phones.

3. Command-and-control, traditional spectrum management in the U.S. in which regulators mandate spectrum for specific uses via regulated technologies. Think over-the-air TV.

The report builds its assessment on this taxonomy, arguing that models 1 and 2 should be extended, and model 3 attenuated. It offers only vague criteria for selecting the appropriate model, advising that the Commission must not forget that "one size does not fit all." The hoary "public interest" standard almost looks definitive by comparison.

The report offers a sort of false trichotomy, with very costly implications. By quarantining property rights to the "exclusive use" slot, it misses the essential fact that private economic incentives drive spectrum use

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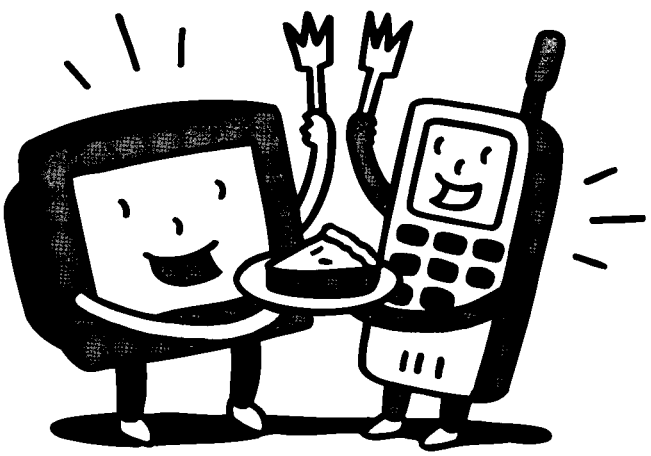
everywhere. Unlicensed bands prosper not by abolishing exclusivity, but by giving users the ability to assert very localized rights. The Starbucks Wi-Fi hotspot network uses unlicensed frequencies, but Starbucks and its partner, T-Mobile, only invest to create their network in the expectation that they will be able to prevent free-riding.

This expectation rests in part on T-Mobile's exclusion of non-subscribers, and in part on the Commission's tight limits on transmission power, which keeps neighboring frequencies apart. But by ignoring the potential for exclusivity embedded in the electromagnetic commons, the Commission stops short of seeing how entrepreneurial initiative could be extended. Why not allow Starbucks – or university and corporate networks – to exclude interlopers or to enjoin malicious interference?



The Commission's taxonomy also misses the huge importance of the "commons" embedded within the "exclusive." The most successful spectrum-sharing now takes place under the auspices of cellular and personal communications services (PCS) licensees – the closest we have to spectrum *owners* – which organize collective use of airwaves for more than 150 million mobile phone subscribers, thousands of manufacturers (from chipmakers to handset suppliers) and scores of virtual networks (from personal digital assistants to text-based wireless Web applications). The average consumer cost is 10 cents a minute, including long distance and roaming. If these networks were allowed to use additional spectrum, they would undoubtedly expand into high-speed data, providing ubiquitous coverage for Internet access (now lacking with Wi-Fi hotspots).

Indeed, a company called Monet Networks now provides 300 kbps to 700 kbps wireless access to subscribers at prices comparable to cable modems and DSL. Monet is licensed to operate on PCS frequencies in the upper Midwest, where wireless voice traffic is less dense. Market solutions, it seems, rush in where licenses are flexible (as in PCS), and spectrum access is cheap. Injecting more flexible, exclusive-use spectrum rights into the market would pump up all kinds of wireless applications, including those of the "commons."

But on the question of freeing spectrum for flexible, exclusive use, the report is a flop. The FCC's November 1999 spectrum policy statement specifically targeted 183 MHz to be transferred to five service categories, with licensees awarded liberal use rights. The task force provides no progress report on that goal; if it had bothered, it might have noted two salient points. First, none of the 183 MHz services had been put into productive use in the intervening three years. Second, this policy failure is incessant – a reality that begs for an explanation. Why does the FCC have such a difficult time making good on its plans to

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expand market access to radio spectrum?

The problem lies in "command-and-control" spectrum allocation, which the report ignores altogether. Indeed, it embraces this approach by arguing for administrative discretion in avoiding "one size fits all," and using vague criteria to pick and choose between more exclusive spectrum here, more unlicensed spectrum there. A consumer-friendly solution would allow markets to determine how airwaves are used.

THE FCC ZONES MORE SPECTRUM

That command-and-control clings to life in the Commission's spectrum regime is illustrated vividly in the first agency rulemaking in response to the report. In December 2002, a Notice of Inquiry was issued to consider rules allowing unlicensed devices to share television channels. The notice pats the agency on the back, noting that:

> The Commission's rules for unlicensed transmitters have been a tremendous success. A wide variety of devices have been developed and introduced under these rules for consumer and business use, including cordless telephones, home security systems, electronic toys, antipilfering and inventory control systems and computer local area networks.... The success of our unlicensed device rules ... shows that there could be significant benefits to the economy, businesses and the general public in making additional spectrum available for unlicensed transmitters.

Missing in the notice is any sense of what unlicensed use may have cost. No mention is made of the alternatives sacrificed so that the 2.4 GHz band could be reserved for cordless phones, wireless local networks and other applications. But let's assume that the existing band is every bit the smashing success the Commission means to assert. This does not imply that allocating the *next* band to unlicensed use will produce similar results.

Indeed, an argument for unlicensed spectrum cited by the report is to encourage users to invest in equipment that overcomes crowding. Perhaps the 2.4 GHz unlicensed band should continue to develop on this margin, using more sophisticated technology to permit more intensive exploitation of the current allocation.

It all depends. How much do the upgrades cost? What other technologies are waiting to use the TV band, and how important are they? Which can be efficiently shared with low-power applications, and which need bandwidth all to themselves?

The FCC does not know and does not try to learn. That, after all, would be to take on what the task force called the "almost impossible task of trying to keep pace with the ever-increasing demand for spectrum and the continuing advances in wireless technology and applications."

Instead, the report simply assumes away the issue. In advancing an allocation limiting new TV band use to unlicensed devices selected by regulators, government planners defoliate the "almost impossible" thicket they profess to fear. A vast array of wireless technologies will be precluded by the FCC's edict, which mandates those systems most appealing to commissioners.

But first, we wait. A long delay was officially kicked off in December 2002. Champions of unlicensed devices will now seek rules to share channels with TV broadcasters. Insiders familiar with the FCC's interest group pecking order may liken this to a nature documentary featuring a pack of hyenas cornering a gimpy antelope. Except these predators will chew their meals very slowly.

A CHEAP SPECTRUM POLICY

There is a market solution. In 1996, the then-Chair of the Senate Commerce Committee,

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South Dakota Republican Larry Pressler, proposed issuing "overlays" to reallocate TV spectrum. This approach would grandfather existing TV stations, while allowing new licensees to use the "white space" around incumbents' signals. Entrants could then attempt to negotiate voluntary agreements in which, for a price, the old users move and release their spectrum for new services. The idea builds on the overlays used in PCS, where new licensees either avoided incumbents' transmissions or paid them to relocate.

Such overlays would effectively establish ownership, triggering market solutions. Instead of government-imposed interference standards determining if radio can share frequencies used by a UHF TV station, the overlay rights holder searches for a profitable solution. In particular, these owners would voluntarily select from a rich mix of interference rules and spectrum-sharing arrangements in a competitive quest for product development. If new "software defined" radios – or other technologies – can share spectrum with TV broadcasters, market incentives will drive implementation. The degree of interference permitted would be subject to negotiation between the parties.

ArrayComm – the provider of an innovative technology offering high-speed wireless Internet access in Australia – does not fit the FCC's preferred regulatory dress in the TV band. The firm told the task force that it opposes "the indiscriminate call for more unlicensed spectrum" as the broadband solution. With the power limits necessary to keep unlicensed users in their own space, "one would have to deploy hundreds of thousands of access points" to rival the national coverage they could deliver (using higher emission levels in licensed spectrum) with about 20,000 sites. ArrayComm objects to the "uncritical exaltation of unlicensed spectrum." Yet, the Spectrum Policy Task Force Report proposes large new unlicensed allocations, while planned licensed allocations are actually *reduced.*

The call for regulation is a plea for help: *Stop me before I protect low quality receivers again.*

The task force report proposed just 100 MHz of bandwidth for new licensed services over five years. This shrank the (entirely unfulfilled) 183 MHz proposal of three years previous, and was tiny in comparison to an FCC senior staff proposal issued the same day. The latter asked the Commission to auction flexible rights for the use of 438 MHz of the most valuable portions of the spectrum in a "big bang." The policy would give spectrum markets the scale and liquidity to invite substantial risk capital.

COMMANDS AND CONTROLS

With the tepid task force proposal for licensed spectrum, however, innovative market structures are destroyed even before they are imagined. The result will not be mitigated by the report's misplaced attention on front-loading interference standards. The report states that the Commission must "[c]learly and exhaustively define spectrum users' rights and responsibilities." But trying to anticipate the myriad dimensions of conflict merely delays competition. The productive solution is to authorize new users quickly while planning

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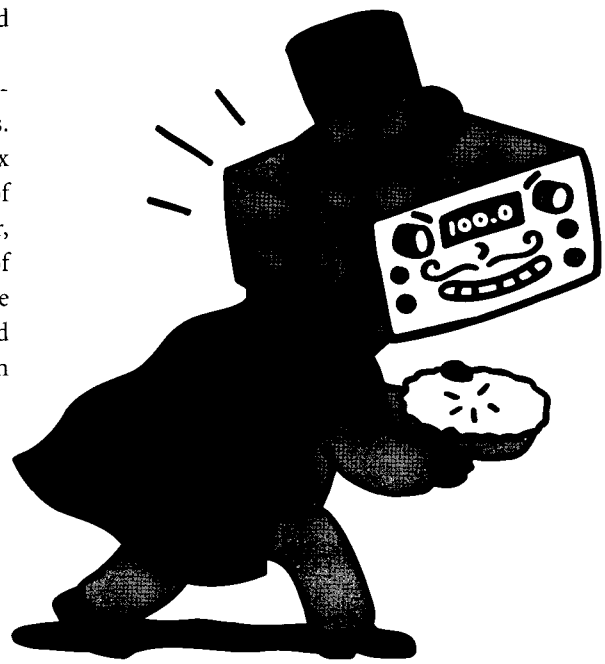
for fair and efficient dispute resolution. New rules are generally not needed; if the FCC already has one thing going for it, it is an abundance of administrative law. Historical practice forms the basis of reasonable expectations. Other countries have not found it chaotic to define rights to radio spectrum in sketchy fashion, allowing arbitrators and courts to resolve issues as they arise.

In 1996, for example, Guatemala introduced explicit spectrum property rights. Spectrum users define their airspace with six simple variables: frequency, location, hours of operation, maximum transmission power, maximum power emitted at the border of adjacent frequencies, and duration of the right. In such an environment, a thousand market structures can bloom, along with rules to accommodate them.

Even when advocating deregulation, the report embraces command-and-control. For instance, in its frustration with rules that waste spectrum in the name of protecting antiquated technologies, the Commission recommends regulations for receiving equipment – a major extension of the Commission's mandate. But poor receivers do not cause interference; they are a problem because the FCC continues to block new uses that might make them obsolete.

The call for regulation is a plea for help: *Stop me before I protect low quality receivers again.* The better approach, surely, is for structural reforms that eliminate this interference at its source – namely, at the FCC.

The "command-and-control" that the report ostensibly schedules for phasing out is continually resuscitated with technocratic determination. Consider, for example, how a receiver standard for transistor radios would play out. With better radios, more stations might be able to broadcast in a specific locality, giving listeners more choices. Let us assume that the new programs are worth the extra cost of designing and manufacturing better radios. Yet, some consumers, perhaps in rural areas where the new stations are unlikely to materialize, will not want to pay for



new equipment. Receiver standards set by government bludgeon the resolution of these differences, imposing a political one-size-fits-all fix. This, according to the Spectrum Policy Task Force Report, is just where we do not want to be.

The FCC, it seems, is caught between an acknowledgement of the compelling need to let markets decide how spectrum is used and an irresistible urge to force the market to accept the Commission's guesses about how spectrum can be used most efficiently. Consumers are paying the price for the contradiction and – if this report is a forecast of future Commission policies – will continue to do so for years to come. M

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THE Value OF New Drugs

The Good News in Capsule Form

By
Frank R. Lichtenberg

Are modern pharmaceuticals worth the price? With America's drug bill rising rapidly and government working overtime to contain Medicare and Medicaid costs, the question is unavoidable these days.

On the basis of years of intensive research, I believe the answer is a resounding "yes." For not only is there strong evidence that the benefits from new pharmaceuticals in terms of longer life and better health in old age far exceed the costs, it appears that drug innovation also saves money by reducing demand for other forms of medical care.

I have approached the measurement challenge from a variety of perspectives. One of my studies summarized here uses aggregate data for the United States to assay the contribution of new drug approvals to increases in lifespan. Several others use disease-specific data to evaluate the effect of pharmaceutical innovation on hospitalization rates and quality-of-life indicators like days of disability and degree of limitation of activities. Still others use data from individual cases.

Virtually all of my research is based on large, publicly available data sets. These include the Vital Statistics – Mortality Detail files, the National Ambulatory Medical Care Survey, the National Hospital Discharge Survey, the National Health Interview Survey, the Medical Expenditure Panel Survey, and unpublished

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NEW DRUGS

FDA data. The mortality data are based on a complete census of deaths in the United States, and most other data sets are based on large, representative samples of health care providers and households.

My studies are based on data covering all medical conditions and all drugs. They therefore provide evidence about the health and economic impact of new drugs in general, not the impact of specific drugs or on particular diseases. While the methods I use could, in principle, be applied to specific drug classes or diseases, the number of observations about particular drugs and diseases is generally too small to obtain statistically reliable results.

LONGEVITY

Between 1960 and 1997, Americans' life expectancy at birth increased approximately 10 percent, from 69.7 to 76.5 years. Translated into value in the way economists are inclined to do so – that is, at rates inferred from individuals' willingness to sacrifice income for marginal increases in safety – this is a very large number. William D. Nordhaus of Yale estimates that the value of life extension during the 20th century nearly equaled the nation's gains in material consumption.

While life expectancy has risen at an average rate of one-quarter of 1 percent annually since 1960, the rate has fluctuated substantially. Life expectancy increased more than 0.7 percent in 1961, 1974 and 1975, and declined more than one-quarter of 1 percent in 1963, 1968, 1980 and 1993. Measurement error is unlikely to account for much of the fluctuation. Nor does the rate of growth in income seem to matter: the period in which life expectancy increased most rapidly (1973-75) was also a period of dismal macroeconomic performance. There is, however, a strong, statistically significant relationship between drug introduction and life expectancy. Periods in which the most new drugs have been approved tend to be the periods in which longevity grew most rapidly. The number of drugs available in a given year is not simply equal to the sum of the number of drugs approved in all previous years, since the introduction of new drugs sometimes renders older drugs obsolete. I estimate that the obsolescence rate is about 5 percent per year.

The statistical relationship between innovation and longevity implies that the average new drug approval increases the life expectancy of people born in the year the drug is approved by 5.8 days.

This may sound modest. But since there are approximately 4 million births per year in the United States, the average new drug approval increases the total expected life-years of the cohort by 63,700 years (4 million births times 0.016 years/birth).

New drug approvals also increase the life expectancy of people who will be born in the future – but by a smaller amount, because drugs eventually become obsolete. I estimate that the average new drug approval increases the longevity of current and future Americans by 1.2 million life-years.

The cost to the pharmaceutical industry of bringing a new drug to market is in the ballpark of $500 million. Hence cost per life-year gained is a bit more than $400. Since the value of a life-year is in the $150,000 range, outlays for new drugs are plainly an incredible bargain.

Increased longevity, while desirable for its own sake, may also reduce medical expenditures. A recent National Academy of Sciences study, whose principal author was Kenneth G. Manton of Duke University, showed that

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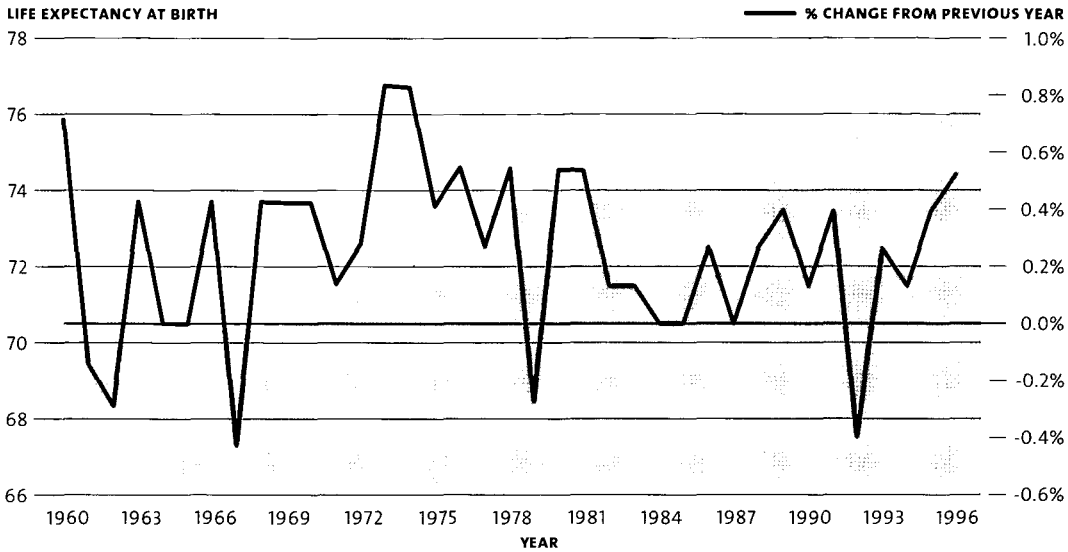
LIFE EXPECTANCY AT BIRTH, 1960-1997: TREND AND FLUCTUATIONS



costs in the final two years of life were lower for people who lived longer.

Case Studies: Orphan Diseases and HIV

During the last two decades, there have been large, sudden increases in the number of drugs available to treat two classes of disease: "orphan" – that is, rare – diseases, and human immunodeficiency virus (HIV). The average annual number of drugs for rare diseases brought to market during 1983 to 1999 was 12 times as great as it was during 1973 to 1982, and the average number of HIV drugs brought to market annually during 1994 to 1998 was three times as great as it was during 1987 to 1993.

The increase in drugs for rare diseases occurred because Congress passed the Orphan Drug Act of 1983, which increased manufacturers' incentives to invest in otherwise unprofitable therapies for rare diseases. The increase in drugs for HIV followed the identification of the virus causing AIDS in 1984.

Both spurts of drug development offer good opportunities to investigate the effect of pharmaceutical innovation on mortality. In the half decade before the Orphan Drug Act went into effect (1979-1984), mortality from rare diseases grew at the same rate as mortality from other diseases. In contrast, during the next five years, mortality from rare diseases grew more slowly than mortality from other diseases. I estimate that one additional orphan drug approval in a given year prevents 211 deaths in the following year, and ultimately prevents 499 deaths. All told, about 108,000 deaths from rare diseases will ultimately be prevented by the 216 orphan drugs that have been approved since 1983.

Consistent with previous patient-level studies, my own research suggests that new drugs played a key role in the post-1995 decline in HIV mortality. I estimate that one additional HIV drug approval prevents about 6,000 HIV deaths in the following year, and ultimately prevents about 34,000 HIV deaths. HIV drug approvals have reduced mortality both directly and indirectly, via increased

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consumption of multiple drugs, that have synergistic effects when used as cocktails. One additional HIV drug approval in a given year results in 1.2 million additional HIV drug units consumed in the following year, and ultimately results in 3.6 million additional HIV drug units consumed.

Effect of Increased Drug Use Associated With Medicare Eligibility

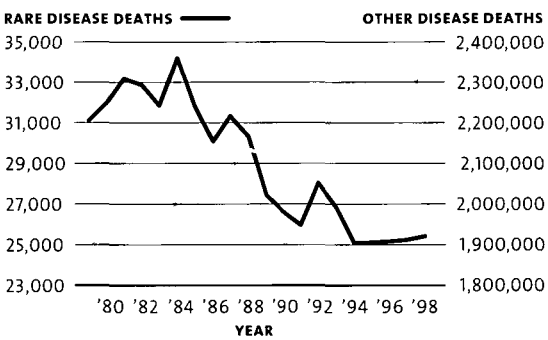
Most people become eligible for Medicare the instant they reach 65. Although Medicare does not pay for most drugs for outpatients, it does subsidize a service – physician care – that people must use in order to obtain prescriptions. I found that utilization of ambulatory medical care increases suddenly and significantly at age 65, presumably due to Medicare eligibility. The evidence points to a change in the frequency of physician visits precisely at age 65. Attainment of age 65 marks not only an upward shift but also the beginning of a rapid upward trend (up until age 75) of about 2.8 percent per year in annual physician visits per capita.

The number of physician visits in which at least one drug is prescribed also jumps at age 65. Data from the 1996 Medical Expenditure Panel Survey indicate that people between the ages of 66 and 75 consume about two-thirds more medicine per person than those between the ages of 56 and 65.

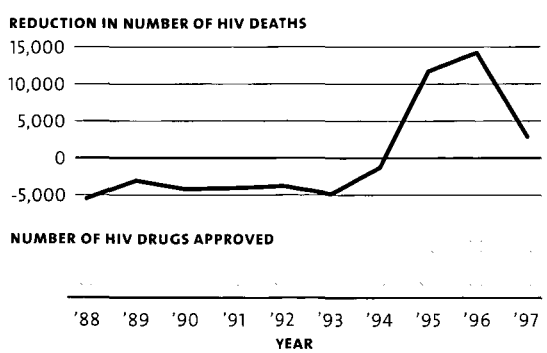
I examined whether this increase in physician visits and drug utilization leads to an improvement in outcomes – a reduction in mortality – relative to what one would expect given the trends in outcomes prior to age 65. And, indeed, it seems to: there is slower growth in the probability of death after age 65. Physician visits (which are highly correlated with prescription drug utilization) have a negative effect on the death rate, conditional on age and the death rate in the previous year. A sustained 10 percent increase in the number of visits ultimately leads to a 5 percent reduction in the male death rate.

Data on age-specific death probabilities every 10 years, back to 1900 – i.e., before, as well as after, Medicare insurance was created – provide an alternative way to test for the effect of Medicare on longevity. These data strongly support the hypothesis that Medicare increased the survival rate of the elderly. The gain was on the order of 13 percent.

NUMBER OF DEATHS FROM RARE DISEASES AND OTHER DISEASES, 1979-1998



HIV DRUG APPROVALS AND HIV MORTALITY REDUCTION



QUALITY OF LIFE

Using data from a variety of sources comprising over 300,000 observations, I analyzed the

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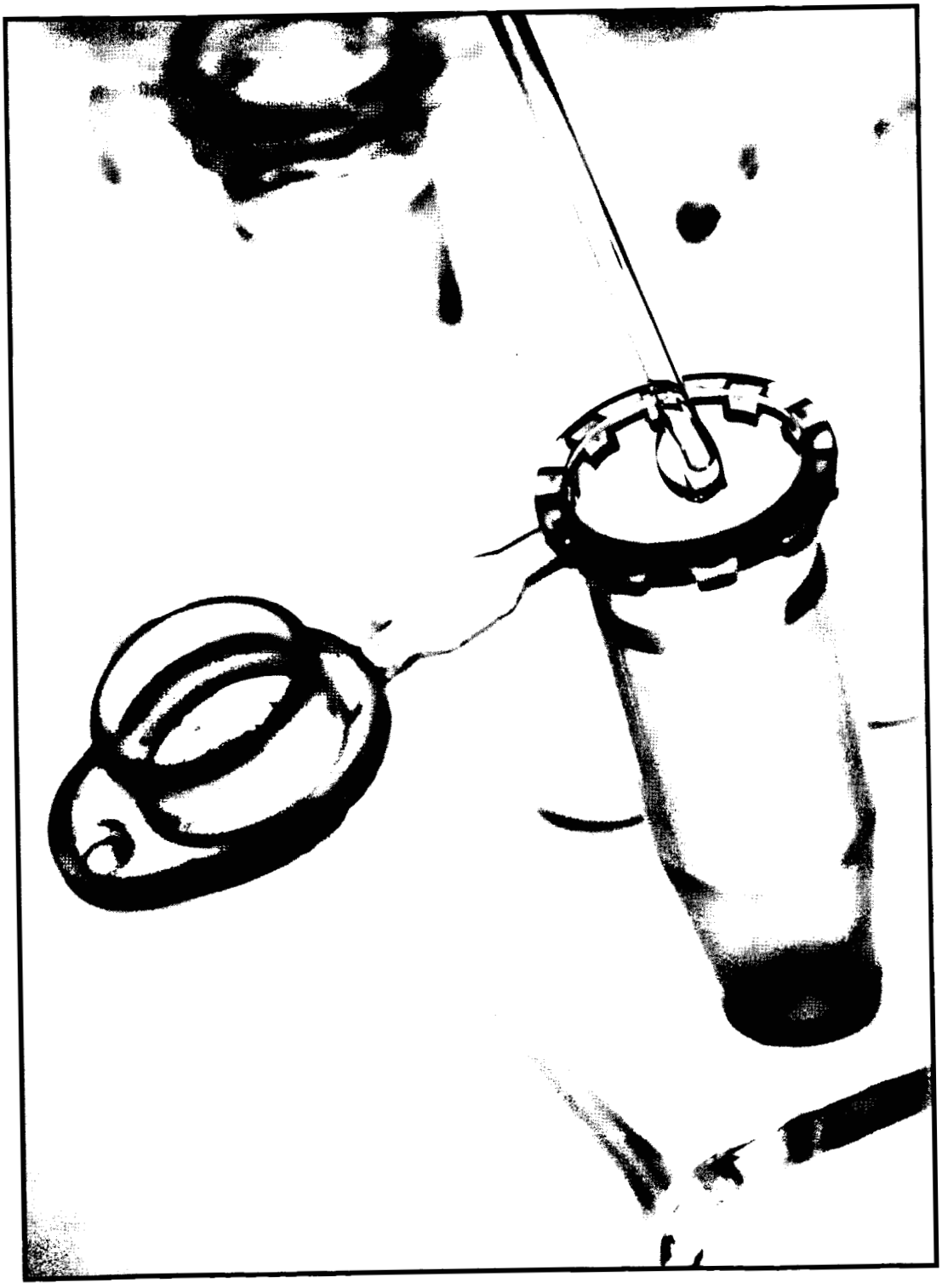

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impact of new drugs on:

- Whether a person is limited in work.
- Whether a person is unable to work.
- Whether a person has activity limitation.
- The total number of restricted activity days in the last two weeks for a given condition.
- The number of workdays lost in the last two weeks for a given condition (for currently employed workers ages 18 to 69).

I investigated the effect of drug vintage – defined as the year in which the FDA first approved a drug – on health. In particular, I tested the hypothesis that a person's health improves if the drugs he or she consumes are newer. If this were true, the average health of a group of people would rise with the average vintage of the drugs they consumed, and the change in average health would rise with the change in average drug vintage.

The estimates indicate that changes in mean drug vintage clearly do have a potent impact on activity limitations and disability days. The magnitudes of these effects can be illustrated by calculating the costs and health benefits that a 10-year change in mean drug vintage would have.

Suppose that the FDA approval year of the drugs consumed by an individual in 1996 was 1980 rather than 1970. Newer drugs generally cost more than older drugs, and this switch to newer drugs would increase the person's drug expenditure by an average of 27 percent, or $71 annually. However, my estimates imply that the switch to newer drugs would yield a number of benefits, whose value would substantially exceed the increase in drug cost.

For workers, the mean number of days on the job lost each year would decline by 21.3 percent, or 1.02 days. Since average daily compensation is about $140, the value of this reduction is about $143. For all people, the mean number of restricted-activity days per person per year would decline by 12 percent, or 1.74 days, and the probability of having an activity limitation would decline by 9 percent. By the same token, the probability of being unable to work at all would decline by 10.8 percent. Since average annual compensation is about $40,000, the value of this reduction is in the range of $300.

TOTAL MEDICAL EXPENDITURES

Case studies have shown that a number of drugs reduce the demand for hospital care. For example, according to the Boston Consulting Group, operations for peptic ulcers decreased from 97,000 in 1977, when H2 antagonists (like Zantac and Tagamet) were introduced, to 19,000 in 1987. This saved $224 million in annual medical costs.

The Scandinavian Simvastatin Survival Study estimated that giving that drug to heart patients reduced their hospital admissions by a third during five years of treatment. It also reduced the number of days they had to spend in the hospital when they were admitted, and reduced the need for bypass surgery and angioplasty. But treatment with the cholesterol-lowering Simvastatin (aka Zocor), did not actually save money. Hospital costs were $8 million lower among the 2,221 volunteers who got the drug, but the medicine itself, at $2 a pill, cost $11 million. On the other hand, the clot-dissolving drug TPA costs $2,000 to administer to a stroke victim, but may save considerably more in terms of reduced long-term care for stroke survivors.

Conversely, there is also evidence that government-imposed rationing of pharmaceuticals leads to increased use of hospital care. A 1991 study examined the relationship between the limits imposed by New Hampshire's Medicaid program on the number of reimbursable medications that a patient can receive and rates of admission to nursing

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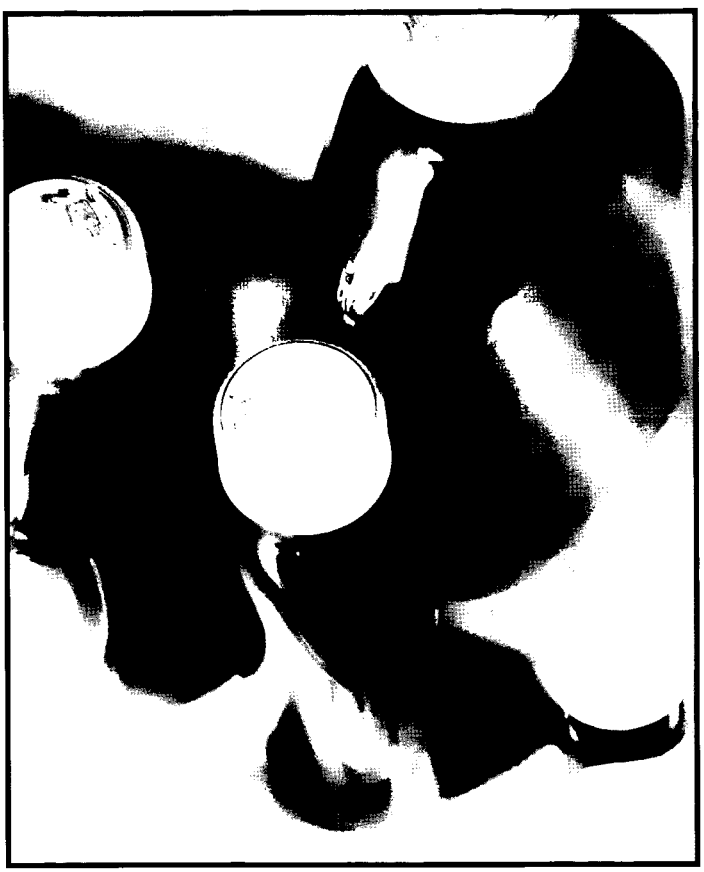
Operations for peptic ulcers decreased from 97,000 in 1977, when the drugs called H2 antagonists were introduced, to 19,000 in 1987.



homes and hospitals. The reimbursement cap roughly doubled the rate of admissions among the chronically ill elderly.

While these studies are valuable, the extent to which their findings apply to pharmaceutical use in general is unclear. Moreover, these studies have yielded mixed results about (or have not addressed) the issue of whether the reduction in hospital cost was outweighed by the increase in pharmaceutical cost. I have performed several studies to assess the general impact of pharmaceutical use on the demand for inpatient hospital care and on overall medical expenditure.

In one study, I constructed a database containing information about utilization of pharmaceuticals, ambulatory care and hospital care, by disease, at two points in time (1980 and 1991 or 1992). The main finding: the number of hospital-bed-days declined most rapidly for those diagnoses with the greatest increase in the total number of drugs prescribed and the greatest change in the distribution of drugs.

An increase of 100 prescriptions was associated with 16.3 fewer hospital days. A $1 increase in pharmaceutical expenditure was associated with a $3.65 reduction in hospital care expenditure (ignoring any indirect cost of hospitalization), but it may also be linked to a $1.54 increase in expenditure on ambulatory care. Diagnoses subject to higher rates of surgical innovation exhibited larger increases (or smaller declines) in hospitalization.

A second study was based on individual-level data, most of which was obtained from the 1996 Medical Expenditure Panel Survey, a nationally representative survey of health care use and expenditures for the civilian population in the United States. This survey collected

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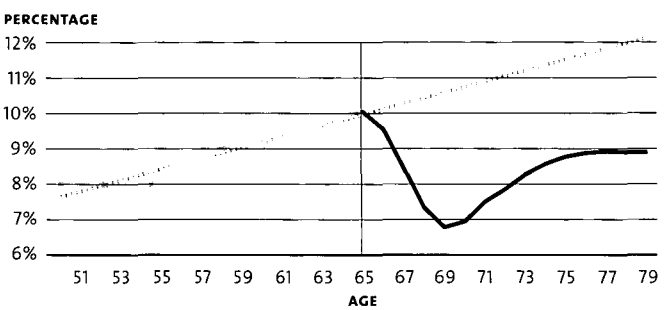
extremely detailed data from 23,230 people on use and expenditures for office- and hospital-based care, home health care, and prescribed medicines. The survey includes data at three levels of aggregation: the individual, the condition (there are 77,000 identified) and the event. A person may have several conditions (e.g., hypertension, diabetes, and glaucoma), and a given condition may be associated with a number of events.

PERCENTAGE INCREASE FROM PREVIOUS YEAR IN PROBABILITY OF DEATH: MEN



The unit of observation in my analysis was a prescribed-medicine event – some 171,000 prescriptions. Over 90 percent of the prescriptions are linked to exactly one medical condition, and the 1996 Medical Conditions file contains summary information about these medical conditions, including the number of hospital events, emergency room events, outpatient events, office-based events, dental events and home health events. Expenditures (and charges) associated with each condition, by event type, can be computed from the records contained in the respective medical-event files.

For example, one can compute total hospital expenditure associated with individual X's hypertension. In addition to calculating expenditure by event type, we calculated total non-drug expenditure – i.e., the sum of expenditures on the six event types listed above.

The survey's data enable us to control for many important individual attributes, including sex, age, education, race, income, insurance status, who paid for the drug, the condition for which the drug was prescribed, how long the person has had the condition, and the number of medical conditions reported by the person.

By controlling for condition, we are in effect comparing individuals only to other individuals with the same condition. We do not control for drug class, however, since we do not want to rule out comparisons between people consuming drugs in one class (e.g., SSRI antidepressants like Prozac) and people consuming drugs in another class (tricyclic antidepressants like Tofranil) for the same condition.

My objective was to determine the effect of drug age – the number of years since the FDA first approved the drug's active ingredient(s) – on outcomes and expenditure, controlling for the factors cited above. But in addition to those observed individual differences, there may be other, unmeasured, determinants, like the physician's practice style. Physicians prescribing older drugs may be less well trained, less likely to keep up with advances in medicine, and more likely to practice in substandard facilities. Fortunately, the fact that many individuals in the sample have both multiple medical conditions and multiple prescriptions means that we can control for all individual characteristics – both observed and unobserved – by pursuing a second approach. This involved estimating a model that includes individual effects.

First, I analyzed the relationship between

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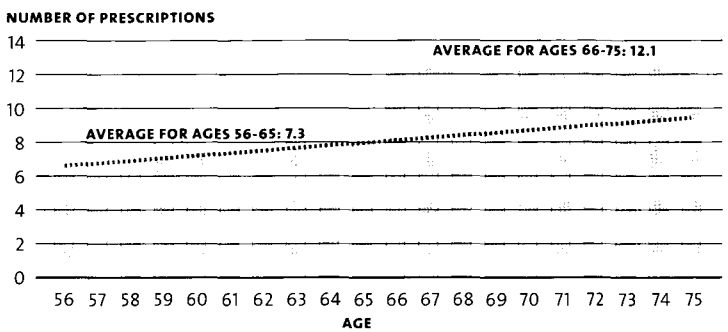
the age of the drug and the amount paid for the prescription. Not surprisingly, I found that new drugs are, on average, more expensive than old ones prescribed for the same condition. For example, if a 15-year-old drug were replaced by a 5.5-year-old drug, the cost of the prescription would, on average, increase by about $18.

Then, I examined the relationship between the age of the drug and the number and cost of non-drug medical events associated with the condition. Hospital stays are the most important of these, since they account for almost 42 percent of total medical outlays. The estimates revealed that people consuming newer drugs had significantly fewer hospital stays than people consuming older drugs.

MEDIAN NUMBER OF PRESCRIPTIONS, BY AGE, 1996



Replacing an old drug with a newer one reduces the expected number of hospital stays by 0.0059 – i.e., about six fewer stays per thousand prescriptions. Since the average expenditure on a hospital stay is $7,588, one might expect a reduction in hospital expenditure of $44 (0.0059 x $7,588) compared to an increase in drug cost of $18. However the reduction in hospital expenditure from the use of newer drugs is actually larger ($56) because newer drugs are associated with shorter, as well as fewer, hospital stays.

The research indicates that reductions in drug age tend to reduce all types of non-drug medical expenditure, although the reduction in hospital expenditures is by far the largest. This average reduction of $71.09 in non-drug expenditure is much greater than the increase in prescription cost ($18), so reducing the age of drugs substantially reduces the net cost of treating a condition. Estimating the non-drug medical expenditure numbers separately for those under and over 65 years of age has no significant effect on the conclusions.

It is sometimes suggested that, because generic drugs tend to be less expensive than branded drugs, allowing people to use only generic drugs might be an effective means of reducing health expenditure. But there's a catch: drugs out of patent and thus available generically tend to be much older than branded drugs.

Suppose that, instead of consuming the actual mix of 60 percent branded and 40 percent generic drugs, people only consumed the generic type. This would increase the mean age of drugs consumed by 31 percent, from 29 years to 38 years. My model implies that raising the average age of drugs consumed in this way would actually increase total treatment costs as well as lead to less favorable medical outcomes.

Drug costs (and changes in drug costs) are visible to the naked eye. But the identification of drug benefits requires careful analysis of good data. Those making drug policy need to consider the full range of effects – not just the costs – of newer drugs.

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Patents

A (Wary) Defense

By Martin Campbell-Kelly

"The patent system is in crisis," the science writer James Gleick recently told readers of *The New York Times.* "A series of unplanned mutations have transformed patents into a positive threat to the digital economy."

Gleick is not alone in raising the alarm. Among others, Lawrence Lessig, an influential Stanford University commentator on public policy toward digital technology, talks darkly of patent "thickets" that have become a barrier to entry for both small commercial software developers and the "open source" community – volunteer programmers who develop software to share with others at no charge. Software makers, the argument goes, are in danger of becoming caught in headlights of the patent juggernaut – frozen in fear of inadvertently infringing on others' property rights.

Patent protection is, in general, problematic because it limits the diffusion of inventions and creates legal uncertainty for those pursuing related innovation. It is especially problematic for software, critics say – in part because the embodied intellectual property can be protected with copyrights alone, in part because the software industry is simply too central to economic growth to risk inhibition in defense of property rights.

There is one point on which almost everyone who has followed the controversy agrees: the system for protecting the intellectual property embodied in software is far from perfect. Yet some perspective on the consequences of these imperfections – not to mention the shortcomings of alternative means of protecting software – is needed, lest in the act of reforming the rules we throw out the proverbial baby with the bath water.

IN THE BEGINNING

In the decade after World War II, when computers were room-size monsters that ran with vacuum tubes and were typically owned by government agencies, aerospace companies or universities, what amounted to software

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(the word had not yet been invented) was given away free. In this hardware-centric environment, software was seen as having no intrinsic value. Programmers were only too pleased – even flattered – to have someone take an interest in their work.

But by the late 1950s, the idea of selling software no longer seemed farfetched. The increasing capacity of computers, and the commensurate increase in size and complexity of programs, created a market for custom-made software and opened opportunities for enterprises that wrote programs to order. The issue of protecting intellectual property was not on the agenda, though. For while software was expensive to write, its narrow functionality limited its value to other computer users. Indeed, software was so specialized that it was usually less work to write programs from scratch than to borrow them.

That changed in the mid-1960s, however. Computer technology had matured to the point where instead of writing one-of-a-kind programs, it became practical to create general-purpose applications. Optimistic vendors envisioned sales of perhaps 100 copies of an individual program.

One of the first such products was a program called Mark IV, introduced in 1967 by a Los Angeles-based company called Informatics. To that date, no patents had been contemplated for software on the grounds that mathematical "algorithms" – the very essence of computer programs – were not patentable. Walter Bauer, founder of Informatics, therefore looked at the copyright alternative.

But copyrights, too, seemed problematic. In 1964, the U.S. Copyright Office allowed software to be copyrighted for the first time, provided that a human-readable copy of the program was deposited in the office for all to see. And as Bauer no doubt surmised, this would allow a would-be competitor to read the program, ferret out the underlying computational techniques and reverse-engineer a clone.

Reverse-engineering is not illegal or uncommon; in fact, it was widely used to diffuse technology in most industries. Patents ensured that innovators got their reward. But since computer algorithms were not patentable, reverse-engineering made possible by publication of the code in widely understood programming languages would have spelled disaster.

So Bauer chose to rely instead on a combination of contract and trade-secret law. Customers were not sold copies of the Mark IV program, but were licensed to use it. If the licensee gave a copy of the software to a third party or tampered with it, the license could be revoked and the licensee subjected to legal sanctions. By the same token, Informatics' employees, who were bound by a trade-secret agreement, could not legally transfer their Mark IV know-how to subsequent employers.

Note that both of these provisions were important because the Mark IV needed two kinds of protection. First, the software had to be protected from what we now call piracy. Second, it was necessary to prevent appropriation of the underlying code by a competitor.

THE FIRST SOFTWARE PATENTS

To obtain patent protection in the United States, an invention must meet several criteria. It must be useful. It must be new. It must be "non-obvious" – that is, not obvious to an individual skilled in the relevant technology. And it must be tangible: laws of nature and

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(as noted earlier) mathematical algorithms can't be patented.

These latter two criteria have generated most of the controversy regarding patent protection for software. Many patented innovations seem obvious – even trivial – to skilled software practitioners. Meanwhile the intangible nature of programs, at whose heart lie mathematical algorithms, has necessitated a lot of creative fudging to make them eligible for patents.

In 1968 – too late for Informatics' Mark IV – the Patent and Trademark Office issued guidelines permitting patents for software if the innovation fit the category of either a "process" or an "apparatus." The first successful application was made by Marty Goetz of Applied Data Research. Goetz had devised a program called Autoflow that could take another program and show its logical flow in graphical form. Flowcharts aren't used much in software development any more, but in 1960s they were *de rigueur*.

Goetz knew that a copyrighted form of Autoflow would be vulnerable to misappropriation because it contained relatively few lines of code, and access to the code would make it relatively simple to clone. So he applied for a patent to deter would-be imitators. Since it was not possible to patent the mathematical algorithms in Autoflow, Goetz expressed the program's workings as a process, analogous to a manufacturing process. In effect, he applied for (and, in 1970, received) a patent for an apparatus that made a particular kind of information transformation.

The Autoflow patent includes a 50-page listing of the program code that would have made it extremely easy to reverse-engineer, but this would have infringed the patent. Nonetheless, software developers were free to learn what they could from the patent, and when it expired, they could apply the knowledge as they saw fit.

THE FALL AND RESURRECTION OF SOFTWARE PATENTS

A crucial difference between a patent and copyright was that only a patent protected against reverse-engineering. But after a decision of the Supreme Court in 1972, software patents fell out of favor for a decade.

The intangible nature of programs has necessitated a lot of creative fudging to make them eligible for patents.

The case, *Gottschalk v. Benson*, concerned a 1968 patent application by Bell Labs. The invention was a technique – really a mathematical algorithm – to manipulate binary-coded decimal numbers. And though the invention was described in terms of process and apparatus, the algorithm could in principle be performed with pencil and paper.

The application was rejected by the Patent and Trademark Office on the grounds that algorithms were expressly excluded – a decision that was reversed on appeal. The PTO subsequently asked for a Supreme Court review, which it won when the court rejected the patent because the claims were "so abstract and sweeping" that they effectively ruled out use of the underlying algorithm for other purposes.

By this date, the Copyright Office had waived the requirement to deposit a human-readable copy of a software product, accepting instead a "machine readable" copy in binary code. This administrative change

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made copyrights far more attractive to software developers because it is very hard to tease out the logic underlying a program from a maze of zeros and ones. Moreover, copyrights lasted longer than patents (a minimum of 50 years) and cost far less to obtain. Best yet, they did double duty as protection against piracy. Not surprisingly, then, the copyright became the protection strategy of choice for almost all software makers.

Parallel to these legal developments, the computer industry was undergoing a commercial revolution associated with the rise of the personal computer in the late 1970s. The creation and marketing of mass-market software for PCs had many similarities with book publishing – indeed, several early entrants were publishers like Random House and McGraw-Hill. So, again, the copyright model offered a comfortable familiarity. The typical end-user license for software like spreadsheets and word processors asserted the producer's copyright, and usually explicitly forbade reverse-engineering. In order to make reverse-engineering almost impossible, the human-readable source code was never disclosed.

But the inadequacy of protection solely through copyright was brought out in numerous disputes in the 1980s. In one landmark case, Lotus contested the cloning of its 1-2-3 spreadsheet by Paperback Software, which had introduced its own spreadsheet called VP-Planner. The two programs performed almost identical functions, but VP-

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Planner retailed for just $99 – one-fifth the price of Lotus 1-2-3.

This was not an obvious case of copyright infringement, however. Paperback Software had written a program from scratch to do the same things as 1-2-3, only the company chose to price its software much lower. Lotus filed a copyright infringement suit in 1987, based on the obscure principle that Paperback had violated the "look and feel" of 1-2-3. Lotus's precedent was a successful 1950s litigation by a greeting card company, in which a competitor was barred from using the texts and images that had been only slightly altered from the original. Lotus won its look-and-feel suit, but subsequently lost a parallel case against Borland Software and its Quattro spreadsheet. It seemed that copyright protection for software generated as much uncertainty as patents.

Both patents and copyrights amount to bargains between innovators and the broader society. The innovator gains certain rights, while society benefits from an increase in the store of knowledge. One of the advantages of patents to society is that they require full disclosure. This is why it is possible to manufacture the generic form of a drug once the patent has expired. By contrast, copyrighted software need only be available in machine-readable form, and thus the secrets of copyrighted programs may be locked up forever.

The copyright-software patent pendulum started to swing the other way in 1981 with the Supreme Court's decision in *Diamond v. Diehr*. James Diehr and Theodore Lutton, who worked for the Federal-Mogul Corporation, an auto parts manufacturer, had made a computerized improvement to a rubber-curing process. In the original process, a real live worker monitored variations in temperature and pressure over time, removing the rubber from the mold when just the right conditions had been achieved. The Diehr-Lutton invention replaced the human agent with a computer program.

The patent application was rejected on the grounds that the invention's only novelty was the use of a mathematical algorithm to replace human judgment. But Federal-Mogul appealed and eventually prevailed before the Supreme Court. Thereafter, in a volte-face, the Patent and Trademark Office encouraged applications for software patents. The number of software-patent applications grew from 1,200 in 1981 to 5,000 in 1989.

The flow, however, soon became a flood, with the number of software patents rising from 9,000 in 1995 to 23,000 in 2000. This occurred for two reasons. First, several successful court challenges to patent rejections led the PTO to become far less strict in what it would allow. Both the PTO and the courts came to the view that software patents need not be justified in terms of process and apparatus. Second, a number of infringement actions induced software makers to secure protection for their innovations as insurance against ending up at the wrong side of an infringement suit. The result was a spiraling of defensive patenting.

THE GOOD, THE BAD AND THE UGLY

There is, however, such a thing as a good software patent – even a great one. One example is the RSA public-key encryption patent, granted in 1983. Before public-key encryption, confidential computer data was sent using the Data Encryption Standard (a technique patented by IBM in 1976). To use DES, however, decryption keys had to be sent at regular intervals to recipients by high-security courier. Thus, with the rising volume of electronic financial transactions, the cost and logistics of key distribution were becoming unsupportable.

Public-key encryption was identified as a

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theoretical possibility in 1975. This technique, if it could be made to work, would eliminate the need to distribute keys, thereby making secure communications cheap and easy. In 1977, three academics at MIT's Laboratory for Computer Science reduced this theoretical possibility to practice by inventing the RSA algorithm (named after its inventors: Rivest, Shamir and Adleman), which MIT wisely patented. The British science writer Simon Singh described public-key encryption as the most important development in cryptography in 2,000 years.

On the basis of the patent, RSA Data Security Inc. was set up to promote and license the technology. Public-key encryption proved of huge importance with the rise of Internet commerce by making low-value financial transactions secure at negligible cost. Netscape and Microsoft licensed the technology for their browsers. Without cheap, secure communication, e-commerce would not have been possible. Today, 20 years on, RSA Security has 11,000 customers, 1,000 technology partners and annual sales of over $230 million. Although the original RSA patent expired in 2000, the company's future is secured by many subsequent patents.

But some patents are far more problematic. Consider Amazon.com's notorious "one click" patent. The standard method of purchasing from a Web site is to place the goods in a virtual shopping cart, then to provide shipping information at checkout, and finally to authorize payment by credit card. Amazon.com replaces this often-tedious process with one-click ordering. Once one-click has been activated, the user simply clicks on items and all the minutia of payment and delivery are completed on the basis of information already stored in Amazon's database.

The principle criticism of the one-click patent is that it appears blindingly obvious. Note, however, that the innovation did follow from Amazon.com's marketing insight that users found the virtual shopping-cart style of ordering a turnoff, especially when they were looking for a single item. Such knowledge could have come only from the experience of running an e-commerce Web site, informed by consumer research.

This is not a wholly convincing argument for non-obviousness; neither, however, is it negligible. To put it another way, if the value of one-click shopping were so obvious, why did no one implement it earlier?

The one-click patent is one of a class known as "business method" patents. Such patents are not always software-related. However, because most recent examples involve business over the Internet, they have been dragooned into the more general service of condemning the concept of software patents.

In a similar vein, what is known as the LZW patent has also been conscripted into the cause of discrediting software patents. This patent, named for its inventors (Lempel, Ziv and Welch), protected a data compression technique used to facilitate the transmission of so-called GIF images on the World Wide Web. When manipulated by browser software, the compression process is reversed so that the original image is rendered on the computer screen quickly and with little degradation.

The LZW compression method was published in a widely read journal *IEEE Computer* in 1984 and became a popular data compression technique – not only in GIFs, but also in software-based artifacts ranging from laser printers to modems. Although the article did not say so, the technique was in fact patented in 1983 by Welch and assigned to his employer, Unisys.

In 1990, Unisys decided to assert its rights and demand royalties from users. The soft-

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ware community was outraged, provoking many to abandon GIFs in favor of public domain JPEG format images. But some infringers were locked into using LZW technology and reluctantly bought licenses from Unisys. These included some large software developers including Microsoft and Adobe Systems, as well as owners of some high-profile Web sites, including Amazon.com.

What affronted much of the software-writing community was the deception – intended or unintended. Software developers had used a technique that was thought to be in the public domain, only to have a patent enforced once they passed the point of no return. Had the need to pay royalties for LZW been known, adequate royalty-free substitutes would no doubt have been developed by the open-source community.

Had the need to pay royalties for LZW been known, adequate royalty-free substitutes would no doubt have been developed by the open-source community.

DEVILS IN THE DETAILS

Arguably, too much has been made of the differences between software and other forms of intellectual property. Most patents in most product categories don't amount to much, but there are lots of them. Any mature, complex manufactured good – whether it be an automobile or a light bulb – makes use of scores of patented innovations. Individually, most of these innovations can seem trivial, but in aggregate they can transform a product. Likewise, any modern software program of substantial complexity and novelty will make use of dozens of patents. For example, IBM's ViaVoice voice recognition software is protected by a hundred patents. Likewise, Microsoft's Office applications are protected by dozens of patents.

To get a sense of how a barrage of patents can be used to protect software innovations in a way that seems comparable with other consumer products, imagine typing the following (admittedly contrived) sentence into Microsoft Word:

> "there wss gorilla warfare in teh pyrenees," said henry.

As Word reviews this sentence, several patented innovations are brought into play. The lower case *t* in *there* and the lower case *p* in *pyrenees* are automatically capitalized; *teh* is corrected to *the*; and the quotation marks are converted to "smart" quotes that differentiate the begin-quote and end-quote notations. Wavy red lines appear under the words *wss* and *henry*, while a wavy green line appears under *gorilla*. All this occurs in the background, without the typist having to call up proofing tools.

The "autocorrect" and smart quotes features are protected by patent 5,787,451, and background checking is protected by patent 5,761,689. A wavy red line (not shown here) indicates a spelling error. Right-clicking over the word *wss* gives a menu of five correct spellings to choose from, of which *was* is the first. Likewise, *Henry* is offered for *henry*. This innovation, which places candidate corrections in order of likelihood based on the user's typing history, is protected by patent 6,377,965. The wavy green line (not shown here) under *gorilla* indicates a grammar or semantic error; right-clicking offers the alter-

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native *guerrilla*. The word *gorilla* is found to be incorrect because of its surrounding context; this feature is protected by patent 5,940,847.

Harnessing so much analytic power in Word looks to be an impressive achievement, and in many ways it is. Although the individual patents may seem insignificant, taken together they save a minute or two a day for perhaps 20 million users. Even by the most conservative calculation, the value of the aggregate benefit to society in time saved and meaning clarified could not be less than $100 million a year.

But this exploration of Word also suggests how many more patented innovations will be needed before the program does a really good job. For example, although Word picked up the incorrect capitalizations of *pyrenees* and *henry*, it would not have corrected *snowy mountains* and *martin*, because they are nouns in their own right. Nor would it have objected to *farther* in place of *henry*, when *father* might have been intended.

In this sense, the word processor is similar to earlier inventions like the automobile and the typewriter. It will not be perfected in one fell swoop, but by the accumulation of hundreds of tiny improvements. Given Word's current shortcomings in grammar, punctuation and spelling, and the irregularity of the English language, a hundred more may well be needed to keep improvements on track.

GRAND CHALLENGES

While the patented tweaks in Microsoft Word scarcely amount to rocket science, the process is very much in line with how other consumer products have evolved. One has only to compare today's television sets with those of the mid-1950s to see what a half-century of incremental improvements can achieve.

However, there are much more compelling examples of software innovation – ideas developed at great expense by teams of researchers that solve seemingly intractable technological problems. Two familiar examples are screen-rendering and speech-recognition technologies.

Consider first, the electronic book, which has failed to take off in the consumer marketplace. One reason for this failure is that reading text from today's computer screens is impractical and uncomfortable compared with reading from a printed page. Even the best of today's screens are clunky and power-hungry, and offer poor contrast.

But screen technology is improving, and many firms are now developing hardware that will fix some of the ergonomic and portability issues. It is worth remembering, though, that the hardware improvements must be complemented by software innovations.

Today, the resolution of a laptop screen is about 100 dots or pixels per linear inch. This does not begin to compare with the minimum 1,000 dots per inch of a printed book, which amounts to 100 times the density of pixels because the appropriate measure of resolution is dots per *square-inch*. That's where Microsoft's ClearType and Adobe's CoolType technologies fit in.

ClearType technology is complex, but the principle behind it is simple enough. ClearType exploits the fact that each pixel on a color screen consists of three subpixels – one for each primary color. Normally, when displaying black characters on a white background, every subpixel is either full on or off, with no gradations between. But ClearType exploits the fact that each subpixel can be set to an intermediate brightness. When ClearType characters are examined under a magnifying glass, one can see that individual subpixels have been used to smooth out the

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blocky, jagged edges of characters and shape up their serifs. CoolType attempts the same goal using different algorithms.

Neither ClearType nor CoolType is likely to be decisive in persuading consumers to switch to e-books. But they underscore the reality that screen technology is advancing on both the hardware and software fronts, and the software companies need the same kind of property protection taken for granted by hardware makers.

An even more distant prospect is speech recognition technology that is a perfect substitute for keyboard entry. Having just written a 380-page book using IBM's ViaVoice dictation software, I can say with some confidence that the system is just about worth the hassle. When I first tried ViaVoice in 1995, I gave up after a few hours. But with each release the product has gotten better. Much of this improvement is due to IBM's speech recognition research, for which it has obtained 170 software patents in the last 10 years.

IBM has been beavering away at speech recognition for 25 years, and perhaps in another 25 years we will have computers without keyboards. But this is by no means certain; speech recognition represents a long-term investment in software research with uncertain rewards.

Screen-rendering and speech-recognition are just two of the problem domains that need to be conquered in computing. Add to those crash-proof computing, high-level Internet security, truly effective search engines and the whole realm of artificial intelligence,

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and one gets a sense of the huge R&D challenges ahead. If private industry is to invest in developing these technologies, it can only do so with the assurance that patent protection provides. Copyright just isn't up to the job.

PATENT ANXIETY

Why is there so much opposition to software patents? Indeed, why are dissenting voices heard in the commercial software industry as well as in the not-for-profit, open-source community?

Complaints are all over the map: there are too many patents, they last too long, there are too many obvious patents, too many patents lack novelty. Above all, critics argue, software patents fail in their fundamental purpose of promoting innovation. Much of the opposition coalesces around the notion of patent "thickets." It is as if, in order to develop new software, one first has to clear a path through a dense undergrowth of patents or risk inadvertent infringement.

There is an element of truth in all these claims, but none of them provides an unarguable case for slaying the software patent dragon. Consider the charge that there are too many software patents. Of the 165,000 patents granted in 2001, 26,000 were software-related. That's a big number, surely – but still modest compared with the 45,000 patents granted in the "chemical" classification. In light of the fact that software is now one of the top U.S. industries – certainly comparable in importance to chemicals and pharmaceuticals – the number of patents is not self-evidently disproportionate.

There are real concerns about the obviousness of some patents. Yet as our earlier examination of Amazon.com's one-click patent suggests, obviousness often means obvious in hindsight.

More generally, examiners of software patents face a particular challenge that the "prior art" is poorly established, compared with mature patent classes. When confronted with a software device, it is more difficult to determine whether it is novel – whether it has been used before in some program or described in print. Only a small fraction of software knowledge lies in academic journals or in earlier patents. Most of it can be found in conference reports that are almost impossible to obtain, in the ephemeral research reports of universities and research laboratories, and in product literature.

In 1995, the software industry financed the non-profit Software Patent Institute to build a prior-art database. But as yet it has not significantly improved matters.

The most damning criticism of software patents is that they inhibit rather than foster innovation. It is argued that companies take out patents largely as a defensive measure, or, in the same vein, to have something to trade with other developers holding patents. Open-source developers reportedly fear that they will reinvent a technique, rendering themselves open to lawsuit.

There are few examples of this happening in practice. The software industry is not uniformly antagonistic to the open-source community; rather, the roles of commercial and open-source software are increasingly seen as complementary. For example, a number of firms (notably IBM, which owns the largest number of software patents by far) have licensed their patents free of royalty to open-source developers.

The patent system trades a period of exclusive use for an indefinite period of common use. And we are surrounded by useful objects that bear testament to the greatness of this vision. Just looking around my office, my eye is caught by examples of inventions now out

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of patent – everything from fluorescent lighting tubes to cylinder door locks to the telephone. There are few comparable examples among software patents – though the LZW compression technique used in GIF images is certainly one.

HOW LONG IS TOO LONG?

A frequently voiced objection to software patents is that the 20-year duration is too long in a rapidly evolving technological environment. But the logic behind this argument – that computing is advancing at an unprecedented speed – does not bear up to close examination. Indeed, it only illustrates the old saw that the closer you are to the tracks, the faster the train appears to move.

It is often argued, for example, that the density of switches on memory chips and microprocessors (and hence computing power) has grown at a historically unprecedented rate. Yet since penicillin was first fabricated in 1941, the yields and efficacy of manufactured antibiotics have increased every bit as rapidly as electronics.

It is also said that the Internet has taken off at unparalleled speed. Again, a little perspective is in order. The Internet took from 1969 to the end of the last century to become widely diffused, while radio broadcasting in the first half of the century took about the same time to change the world.

Likewise, the product life of software is much longer than commonly realized. For example, Microsoft Word is actually 20 years old, and I would think it highly likely that it will enjoy a 50th birthday before it is consigned to the same category as the horse-drawn carriage. The word processor is about as old as the microwave oven and the VCR. So why should it not benefit from patents of comparable duration?

Richard Horton, the editor of *The Lancet*, recently argued the case for extending pharmaceutical patents to 30 years in order to give makers adequate incentives to sustain the pace of innovation. Now, pharmaceutical patents get an even worse press than software patents because the price of drugs can be a matter of life and death. But defenders of the system argue, with good reason, that this terrible situation obscures the fact that innovation will flourish only in an environment in which the huge front-end cost of drug research is protected by patent.

Open-source developers reportedly fear that they will reinvent a technique, rendering themselves open to lawsuit.

Pharmaceuticals seem a special case because the useful life of a patent is artificially attenuated by the reality that it can take up to 10 years for a drug to gain regulatory approval. But the situation is not entirely dissimilar in software, where the value of major innovations is typically enjoyed only after many years of incremental improvement and of parallel innovation in related fields. Recall the role of software in the broader technological environment of screen rendering.

It is not impossible that some superior form of IP protection for software will be created one day. But for this writer, a convincing case to give up on the present system has yet to be made. As Winston Churchill did not quite say, software patents may be the worst form of protection – with the exception of all the others.

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MAKING WORK

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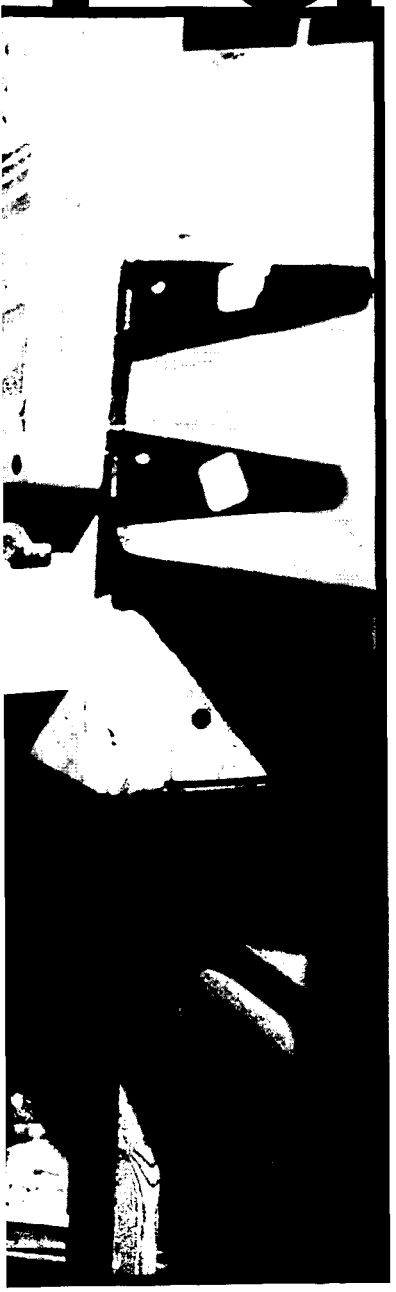
Pay for the disabled, too



by Michael Bernick

There has been a sea change in attitudes toward workers with disabilities, especially non-physical disabilities, over the past 40 years – a growing sense that they should join the mainstream if possible. Still, the majority of workers with disabilities remain outside of the workforce, living primarily on government pensions.

As of January 2003, nearly a million working-age disabled adults in California were unemployed, dependent on Supplemental Security Income (SSI) and/or Social Security Disability Insurance (SSDI). Some have physical disabilities, like limited sight or hearing, or limited use of their arms or legs. A greater number have either developmental disabilities, including autism, severe dyslexia, mental retardation and mental illness. Their combined number in California is larger than the size of the labor forces of most states.

The SSI/SSDI population has received neither the attention paid to the welfare population nor the

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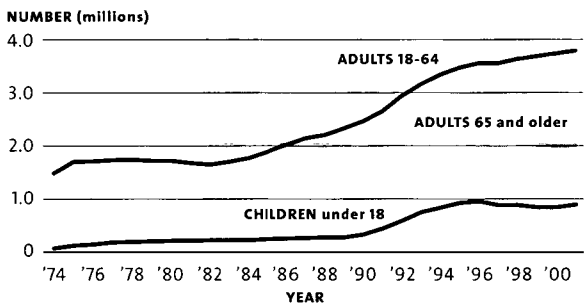
push to employment welfare recipients get. But this is beginning to change, and for good reasons. In part, the new focus follows from pressures to reduce the cost of supporting the large (and growing) number of workers on long-term SSI/SSDI in an era of tight budgets. Other reasons are more positive: workers with disabilities potentially have much to contribute in today's complex and specialized labor market.

SSI CASELOADS BY AGE GROUP, 1974 TO 2001



SOURCE: M. Daly and R. Burkhauser, "The Supplemental Security Income Program," Federal Reserve Bank of San Francisco, September 2000.

THE PROBLEM ESCALATES

The research on employment rates of workers with disabilities utilizes two main data sources, the Current Population Survey (CPS) and the National Health Interview Survey (NHIS). Both rely heavily on self-reporting.

The CPS is a monthly household survey of 50,000 United States households (around 150,000 non-institutionalized civilians), administered by the Census Bureau. It asks a variety of questions on work behavior, including whether any adults in the household have a health problem or disability that limits the kind or amount of work they can do. The CPS goes into more detail for a subsample of the households, asking the work-limitation question for two consecutive years. This allows researchers to construct a matched CPS sample that filters out some disabilities that might be temporary. The NHIS, a survey of 100,000 civilians, was conducted by the U.S. Centers for Disease Control and Prevention from 1983 to 1996.

While the surveys look quite different in many respects, they suggest that the employment rate among disabled adults has rarely exceeded 50 percent. And for most years, it has been in the 30 to 40 percent range.

As striking as the relatively low rates of employment is the negative employment trend among workers with disabilities since the mid-1990s. The conventional wisdom among policymakers is that, following the passage of the Americans with Disabilities Act in 1990, the employment rate for workers with disabilities had increased. In fact, both surveys suggest that the employment rate has been static or even decreased in the late 1990s.

As the employment rate of the disabled declined, the SSI rolls exploded. The current SSI system was created in 1972 and began paying benefits in 1974. It replaced a series of state-run entitlement programs, and was intended by Congress to benefit people unable to work because they were old, blind or disabled.

Between 1974 and 1982, SSI growth was minor; total SSI recipients stood at 3.9 million in 1982. By 1996, however, this number had grown to 6.6 million, with nearly all of the growth coming from the increase in disabled adults ages 18 to 64. By 1999, SSI was the largest federal means-tested benefit program, with an average of 6.3 million people

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receiving checks at a cost of $34 billion to state and federal governments.

PLACING DISABLED WORKERS

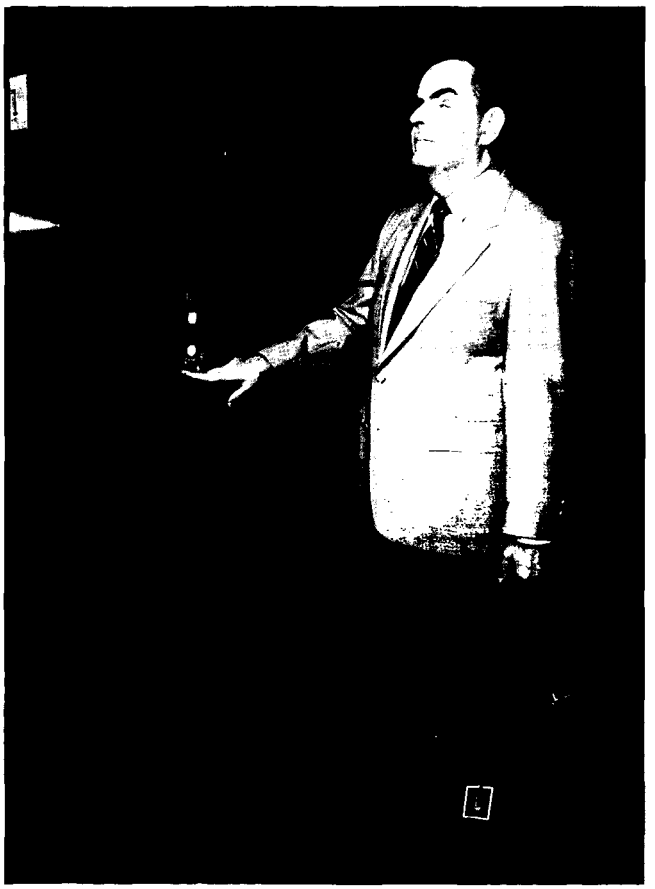
The Davis Administration's efforts to increase employment of the disabled in California took several forms between 1999 and 2003, including placing disabled workers in state jobs and increasing their access to the state's job-placement system. The Administration also took on a number of intensive job-search and case-management projects, including Jobs for All (JFA), which is a direct-placement program for adults, and Workability, for youth.

JFA, launched in May 2000, had nine pilot locations up and running by 2002. In phase one of JFA, the Department of Rehabilitation (DOR) identified workers with disabilities who registered with DOR but were not placed in jobs. In phase two, California's Employment Development Department specialists sought to place these workers in jobs, serving as marketers, motivators and go-betweens with employers. In phase three, EDD job specialists followed placements for at least two years to assist in worker retention or replacement.

This intensive case management, once common, had largely been abandoned over the past decade as EDD's federal funds shrunk. JFA represented a return to an era in which EDD job counselors had the time and the mandate to develop close working relationships with employers and workers.

Between May 2000 and April 2003, 2,487 participants were enrolled in JFA. The majority were workers with developmental or

Workers with disabilities



potentially have much to contribute in today's complex and specialized labor market.

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learning disabilities, or mental health issues. For example, among 36 JFA participants placed in jobs in March 2001, only 10 listed physical disabilities, while 16 listed developmental disabilities like learning disabilities, mental retardation and seizure disorders, and 10 listed mental health issues including depression, schizophrenia and substance abuse.

A majority of participants who came to JFA were receiving some form of public assistance. Nearly 40 percent were receiving SSI or SSDI at the time of enrollment. Another 19 percent were receiving other forms of public assistance.

A snapshot of the participants in April 2003 shows that, of the 2,487 enrollees, 1,106 had found work and 563 had been employed for at least 90 days. Of the 1,381 who had not found work, about 400 had been dropped from the active rolls as no longer looking for work. The remainder – about 1,000 participants – were listed as still looking for work.

Interviews with employers and JFA staff members in early 2003, along with a review of client files, suggest the value of an intensive case effort on behalf of workers with disabilities, as well as the satisfaction of employers with JFA hires. However, they also make clear that the strong disincentives to work built into the SSI/SSDI rules undermined placement efforts.

Laurie Work is an (aptly named) JFA counselor in Santa Rosa, and an advocate for intensive job assistance. She has been with EDD for 12 years and, prior to joining JFA in 2000, she was based at a county welfare office, placing local welfare recipients in jobs. Her JFA caseload is nearly 100 clients, and more than

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A snapshot of the participants in April 2003 shows that, of the 2,487 enrollees, 1,106 had found work and 563 had been employed for at least 90 days.

half are people with what she calls "invisible disabilities" – developmental disabilities or mental health issues.

Work describes her job as one of relationships: "With the participants, it's a lot of problem solving – 'how do I get to a job without a car,' 'how do I present myself to employers,' and so on. With the employers, it's getting to know their needs, and not sending them any bad employees, because then they won't trust you.

"One of my current clients is a man in his early 40s with a diagnosis of severe learning disabilities, a criminal record, and no valid driver's license. So I called an employer who I've formed a relationship with over the past five years. I told the employer that my client, despite his problems, was dependable, that he had been on time for all of his appointments with me, and did the employer have any jobs. And the employer said, 'Laurie, I trust you.' So because I had this employer relationship, the employer was willing to give my client a chance.

"Now the job was not a great job. It was $7.50 an hour, using a leaf blower to help clean parking lots at night, in fact what most people would call a crap job. But my client was thrilled. He called me after he was hired a few weeks ago, and was thrilled. He couldn't wait to get started. When I checked with the employer yesterday, the employer described my client as a fine employee.

"Another of my JFA clients is a woman, also in her 40s, with a form of mental retardation. She worked in a supported employment setting for years, sewing American flags, before being laid off. She's another one who's done everything I've asked her to do, including taking classes on basic office skills at the local adult education center. I've marketed her to employers, and I'm now crossing my fingers that she will get an office job that just became available, at $6.75 an hour. I don't think she would get it without the marketing assistance we're giving her. Realistically, if there isn't this intense effort, these folks are not going to work. They need someone to navigate them through the work system."

Work estimated that at least one-third of her clients are not going to get jobs, and another third who do get them are not going to last 90 days. "There are some of my clients for whom no amount of counseling is going to ensure success," she says. "For some, the boss frowns at them and they decide to quit."

Most JFA counselors are upbeat about

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being able to work with job applicants intensively, about the JFA participants, about the satisfaction of a successful placement. But they also recognize that more than one-third of participants do not get placed, and single out the SSI/SSDI system and its work disincentives as the reason.

Lana Fraser, the JFA coordinator at the Department of Rehabilitation, summarized the views of JFA staff members:

"The SSI/SSDI system is not structured to encourage workers to leave. Some of these workers have spent over a year getting on, and they don't want to risk going through the process again. Further, in the great majority of cases in which workers are not going to earn high salaries, they are not financially better off through work. SSI/SSDI is far more than monetary benefits – it can include housing benefits, health benefits, food stamps, in-home supportive services. Why take a chance of losing these?"

The effective marginal tax rates for people who decide to leave SSI and go to work runs from 50 percent to more than 89 percent. The 50 percent loss in SSI benefits per dollar of earnings is only the starting point of income loss. Though the Earned Income Tax Credit reduces the work disincentives by offsetting taxes owed by SSI recipients who work, it does not compensate for the loss of food stamps (which 50 percent of SSI beneficiaries receive) or of health benefits.

In a widely reported study, the U.S. General Accounting Office found that once they were on the rolls, fewer than 1 percent of SSI and SSDI recipients ever attained paid employment enabling them to become self-sufficient. Furthermore, one-third of the people who left the rolls returned within three years.

Over the past decade, academic experts and government officials have become acutely aware of the disincentives built into SSI/SSDI, and have proposed various fixes – principally allowing recipients to keep health benefits (and other benefits) for longer periods after they go to work. In 1999, President Clinton signed the Ticket to Work and Work Incentives Improvement Act, which allowed for continued health benefits after employment. The Act also established the Ticket-to-Work program, aimed at dramatically increasing the employment services open to SSI/SSDI recipients.

Through Ticket to Work, all SSI/SSDI recipients are offered a voucher enabling them to receive free employment services. For the first time, private job-placement services are given financial incentives to place these recipients. The Act allows the placement

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If workers with disabilities are to be integrated into employment, the motive must be more than charity; employment must be tied to the skills and strengths that these workers bring to jobs.

agencies to receive a percentage of the workers' SSI/SSDI grants upon successful placements and retentions.

Ticket to Work represented the best research on SSI/SSDI and work, and the need to address work disincentives. As of this writing, it is still too early to make judgments, since implementation only started in February 2002 (and only in selected states). But the tea leaves are not encouraging. Fewer than 1 percent of SSI/SSDI recipients have even taken the offer of placement assistance via vouchers. Further, very few private job-placement agencies are participating. Currently, placement agencies only receive reimbursement

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over a period of years and only if the recipient stays in the job.

BEYOND TRAINING AND PLACEMENT: WORK INCENTIVES

Intensive job placement efforts have a role to play in increasing employment among workers with disabilities. During the time the Employment Development Department operated JFA, California's Department of Rehabilitation operated a similar program, the Individual Self-Sufficiency Planning Project (ISSP), which provided intensive job placement. It succeeded in placing about 60 percent of the 228 participants into jobs. The emerging One-Stop system is being touted as serving all job seekers. JFA and ISSP suggest that workers with disabilities will never be well-served in this system, and instead will benefit from a targeted, intensive placement effort.

JFA and ISSP are labor-intensive and expensive, and it is not realistic to think that with modest expansion they will reach any more than a small proportion of the nearly one million California adults on SSI – or the other workers with disabilities not receiving SSI. Major reductions in the SSI adult caseload will require wholesale changes in the incentive structure of SSI, similar to the changes in the structure of welfare brought about by the federal welfare reform of 1996.

For three decades prior to the 1996 reform, welfare recipients enrolled in job training and placement programs, and many found jobs. However, the welfare rolls did not significantly decline until the 1996 law introduced a combination of work requirements and heightened client services. Since 1996, welfare rolls have dropped in California and other states by over 40 percent. Critics of welfare reform initially tried to link these reductions to the job boom of the late 1990s. But the lower welfare rates persisted even after the national economy slowed, and U.S. employment began to weaken, in early 2001.

Following the pattern of welfare reform, the structure of SSI must be oriented to employment. Ticket to Work is an attempt to move in this direction, but participation is voluntary. Ticket to Work needs to add a stronger work-search requirement. Access to SSI benefits for the long term should be restricted to a small proportion of recipients.

The most promising place to start is with stronger job-search requirements among young workers who are signing up for SSI or SSDI. Given that only a tiny proportion of SSI recipients leave the rolls each year, the initial focus should be on keeping young people with disabilities off the rolls. Young people first applying for SSI, either as they leave high school or after an unsuccessful stint in the labor force, should receive intensive job-placement assistance.

Finally, reducing unemployment among workers with disabilities will require a fundamental shift in employers' attitudes. Three decades ago, most children with disabilities were schooled in separate institutions. That is no longer the case. A shift of those children has physically brought children with disabilities into regular schools, and has introduced a new ethos in the schools. This ethos is not only one of the importance of inclusion, but also of the positive values that these children bring to the schools.

Integrating the disabled in the workplace is more difficult than it is in the schools. For it to succeed, employers – especially private-sector employers – must see value added. Ultimately, if workers with disabilities are to be integrated into employment, the motive must be more than charity; employment must be tied to the skills and strengths that these workers bring to jobs.

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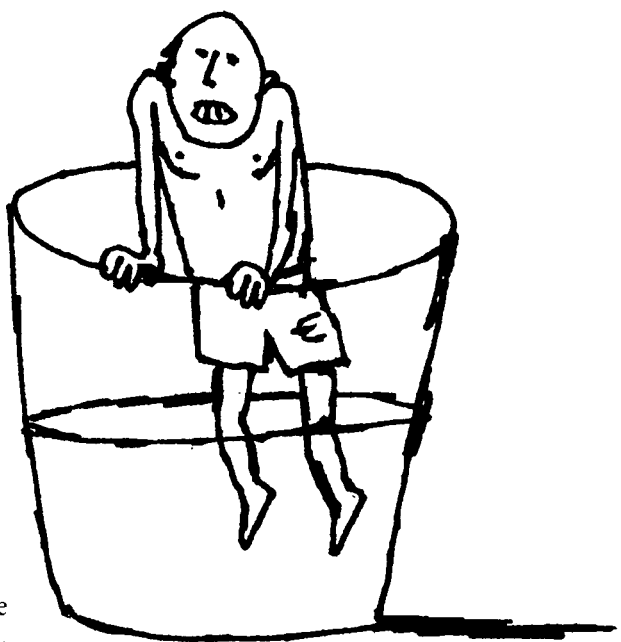
THE Euro

Filling the Half-Full Water Glass



In January, Europe's monetary union will mark its fifth anniversary. However, the congratulations are not exactly pouring in. For there is seemingly little to celebrate: growth in the countries of the euro area has been significantly slower than in the United States in recent years, while unemployment over much of the continent remains stubbornly, disturbingly high. Indeed, in the view of many, the euro has only compounded Europe's myriad economic problems.

By Barry Eichengreen

SCOTT MENCHIN (ALL)

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THE EURO

If anything, the volume of grumbles is rising. In the first few years of the monetary union, Europe's growth was sustained by booming stock markets (which were almost as irrationally exuberant as their American counterparts), and then by the depressed exchange value of the euro (which gave the continent's exports an artificial boost). But now that the both the stock markets and the value of the euro have returned to realistic levels, Europe's problems are mounting. And even some erstwhile champions of the single currency are having second thoughts.

THE PROMISE

Almost everyone would agree that the euro has, in part, delivered on its promise. One tangible benefit has been the deepening and widening of Europe's financial markets. By eliminating exchange rate fluctuations within the union, the euro eliminated the currency risk that previously segmented Europe into a dozen or more separate corporate bond and commercial paper markets. Indeed, with monetary unification, the German "bund" (the Federal Republic's 10-year government bond) became the benchmark on which corporate debt could be priced throughout the euro area. No longer worried about the risk of currency fluctuations within the member nations, investors began searching out the most attractive corporate debt securities regardless of the national market in which they were issued. The result has been a more liquid continent-wide market.

Almost immediately, then, the euro began narrowing the competitive disadvantage created by Europe's lack of U.S.-quality bond markets. Funding costs for European corporations declined as the rate of issuance of new securities exploded. In the first year of the monetary union, the value of euro-denominated corporate bond issues more than tripled, compared to the amounts that had been denominated in the old, "legacy" currencies. And the share of new corporate bonds in the high yield, sub-investment-grade category rose from 4 percent to 15 percent.

The extraordinary growth rates of the markets have since tailed off, but the issuance of corporate debt continues to outpace the growth of their other sources of capital. Note an indirect benefit: easier access to debt markets has helped to finance a wave of mergers and acquisitions, which promises to strengthen Europe's corporate sector.

As with many economic adjustments, there have been losers as well as winners. Europe's banks, confronted with fiercer competition from the bond market, have seen their profits squeezed. Indeed, banking has gone from top dog to dog house in a few short years. It's worth pointing out, though, that the decline was overdue; Europe was overbanked, and U.S. corporations enjoyed a cost advantage as a result of America's more efficient capital markets. The end-product will undoubtedly be a better balanced European financial system, and a more competitive private sector.

A second benefit of the euro is stimulus to price competition. Europeans may have reservations about cutthroat competition *à la Amérique*, but it is hard to deny that more competition was needed to spur the productivity of European retailers and their suppliers. In fact, with just this goal in mind, policymakers have been pursuing what's called the Single Market Program for nearly two decades.

But a true single market is easier to declare

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than to establish. And the existence of a dozen different currencies plainly complicated cross-border price comparisons and reduced the intensity of competition. With the euro, residents of different European countries can finally compare apples with apples. They can more easily determine where prices are lowest, and vote with their feet (or Web browsers). Europe is still far from the competitive ideal of textbook economics, but it is closer than it was five years ago.

It is also worth pondering the counterfactual – that is, how events would have transpired had the members of the euro area retained their national currencies. Europe's history is replete with instances in which economic and political shocks led to sharp changes in currency exchange values, undermining economic stability. A classic example is Germany's reunification after the fall of the Berlin Wall, which was a major factor in the currency crisis of 1992.

Now imagine a shock like the recent military action against Iraq, which raised diplomatic tensions between the U.S. and France. In this riskier political environment, investors might have fled the French franc for, say, the German mark, forcing a devaluation of the franc and perhaps other currencies as well.

One of the goals of the euro's creators was to establish a zone of currency stability in which exchange rate crises could no longer occur. Events like the high-tech stock bubble, Al Qaeda's attack on the World Trade Center, and war in the Middle East all could have (and likely would have) produced currency chaos in pre-euro days. The residents of Euroland can at least take heart that this specter has been vanquished.

REAL GDP GROWTH SINCE THE START OF 2002

PERCENTAGE CHANGES, 1Q 2002–2Q 2003

	EURO AREA	U.S.
GDP	0.8%	2.7%
Consumption	0.9	2.8
Government Spending	2.2	3.8
Investment	-1.9	1.6
Exports	1.4	2.3

NOTE: The 2nd quarter 2003 figure for the euro area is an estimate based on Germany and France.

SOURCE: JP Morgan Global Data Watch (August 29, 2003, p.7).

THE COST

But "what-ifs" rarely sway public opinion when the costs of the policy in place are palpable. The most fundamental constraint of monetary union is that the central bank must set uniform interest rates for the entire zone. And the effect on Europe has been to accentuate the boom-and-bust cycles experienced by individual national economies. In Ireland, growth more rapid than the European average also meant inflation above the European average. But since the level of market interest rates was necessarily the same throughout Euroland, the real interest rate (the market rate minus the rate of inflation) was lower in Ireland than elsewhere.

The perverse result was that firms in Europe's fastest growing country effectively had the lowest cost of borrowing, further stimulating Ireland's already overheated economy. The opposite was true in Germany, where slow growth meant low inflation and hence high real interest rates. But the European Central Bank, which set monetary policy with average European inflation and growth in mind, could do little to address these divergent national trends.

Ireland's boom was mainly the result of the fact that the country is home to so many electronics firms. Similarly, the fact that growth there has now decelerated mainly reflects the slowdown in the high-tech sector worldwide. California went through a very similar cycle over the last five years and, like Ireland, is now attempting to come to grips

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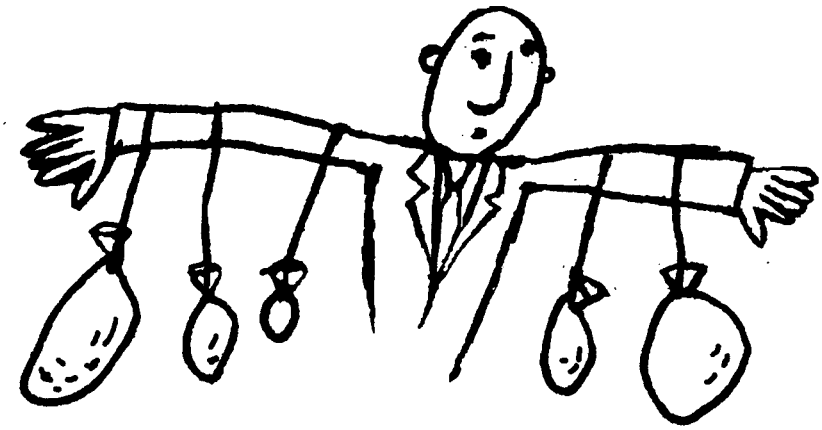

The Stability and Growth Pact aims to compel national governments to keep their budgets in surplus – or at least close to balance – in normal times, so they can move safely into deficit when recession looms.

with the consequences. But it is far from clear that California – or, for that matter, the United States – would have been better off had the Federal Reserve pursued a significantly tighter policy during the technology boom and stock market bubble. Many economists would argue, to the contrary, that the central bank should simply keep its eye on the ball – which in this case means focusing on economy-wide inflation.

This is just what the European Central Bank did for the last five years. In fact, its policies have conformed quite closely – even closer, by some estimates, than the Fed's – to the Taylor Rule, the simple rule of thumb relating short-term interest rates to inflation and the output gap that is the internationally recognized benchmark for monetary policy.

What California needed during the boom, we now know, was greater fiscal discipline. It should have resisted the temptation to raise public spending along with tax revenues, instead building a rainy day fund for bad times. The same logic applies to members of Europe's monetary union: since the common monetary policy cannot be tailored to the needs of any single nation, members should adjust their fiscal stances to counter local shocks. And this is just what Ireland did, running substantial surpluses in the late stages of its boom.

FISCAL FOLLIES

Fiscal policy is, in fact, at the center of the current debate over monetary union. Europe's Stability and Growth Pact aims to compel national governments to keep their budgets in surplus – or at least close to balance – in normal times, so they can move safely into deficit when recession looms. But by failing at

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the first task, the pact has frustrated rather than facilitated the second.

A number of European governments were especially lax during the recent expansion. Having gone on crash diets in the 1990s to qualify for membership in the monetary union, they succumbed to a loss of fiscal discipline thereafter. Consequently their deficits were already close to the Stability Pact's putative ceiling of 3 percent of GDP when the current slowdown struck.

They then came under pressure to prevent their deficits from widening further. As a result, their ability to use fiscal policy as what economists call an "automatic stabilizer" – injecting stimulus in lean times, reducing total demand in fat times – was inhibited. With no safe place to turn politically, these same governments have been inclined to let their automatic stabilizers operate in the current economic downturn. And in the process, they have eroded the credibility of the fiscal rules on which the monetary union is built.

European governments have never been particularly effective in employing fiscal policy. But this impotence has become even more of a problem with the advent of the euro. Now that a single currency and a single monetary policy prevail throughout Euroland, fiscal policy is all that's left to buffer national (or local) shocks.

The unspoken question is why the Stability Pact exists in the first place. On what grounds does creating a monetary union justify interfering with national fiscal policies? Most of the arguments made to this point are fallacious. The only one that holds a drop of water is that chronic budget deficits might eventually render a country's debt unsustainable, precipitating a financial crisis and forcing the European Central Bank to intervene.

Imagine – to pick a country not entirely at random – that Italy runs chronic deficits. Eventually the debt burden grows so heavy that voters rebel against the exorbitant taxes needed to service it. Rome would then be unable to service the debt, leading to panic selling of Italian bonds. The panic might spill over to other markets, as big institutional investors dumped assets in a scramble to sustain liquidity. Questions might then arise about the solvency of banks – mainly, but perhaps not exclusively, Italian banks – that hold large quantities of bonds.

The European Central Bank presumably would not stand by idly. It would intervene by buying up Italian bonds and providing emergency liquidity to distressed financial institutions. A national debt crisis could thus undermine the European Central Bank's resolve to maintain price stability through a consistent anti-inflationary policy.

Fiscal prudence is a prerequisite for debt sustainability – it is necessary whether a country belongs to a monetary union or not. But monetary union alters the incentives of governments in unfavorable ways. So long as the Bank of Italy still printed the lira, Italians alone would bear the consequences of their government's fecklessness. If there was a debt crisis in Italy, it would be the Bank of Italy that had to respond in the first instance. If responding produced inflation, that meant Italian inflation. And knowing this, there would be domestic pressure for the Italian government to limit its fiscal excesses.

But now that the European Central Bank is Europe's lender of last resort, any consequence of central bank intervention would diffuse throughout Euroland. If the ECB purchases bonds to support Italian financial markets or cuts interest rates to relieve distressed financial institutions, the result is additional inflation throughout the euro area.

This creates a classic free-rider problem in which Italians know that if their government's

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undisciplined policies go awry they will bear only a fraction of the costs. The likely consequence is less public pressure for a government to avoid fiscal excesses. The Stability Pact limiting the right of national governments to run deficits can thus be seen as a mechanism for internalizing this consequence and disabling what would otherwise become an engine of inflation.

BUDGET BALANCES IN EU MEMBER STATES, 2001–2004 (% OF GDP)

	BUDGET BALANCE				CYCLICALLY-ADJUSTED BUDGET BALANCE			
	2001	2002	2003	2004	2001	2002	2003	2004
Belgium	0.3	0.1	-0.2	-0.1	-0.4	0.1	0.2	0.0
Germany	-2.8	-3.6	-3.4	-2.9	-3.0	-3.3	-2.6	-2.4
Greece	-1.9	-1.2	-1.1	-1.0	-2.3	-1.8	-1.8	-1.9
Spain	-0.1	-0.1	-0.4	-0.1	-0.8	-0.4	-0.4	-0.1
France	-1.6	-3.1	-3.7	-3.5	-2.2	-3.3	-3.5	-3.3
Ireland	1.2	-0.3	-0.6	-0.9	0.0	-0.9	-0.3	0.1
Italy	-2.6	-2.3	-2.3	-3.1	-3.1	-2.1	-1.8	-2.7
Luxemburg	6.4	2.6	-0.2	-1.2	4.1	2.0	0.5	-0.3
Netherlands	0.1	-1.1	-1.6	-2.4	-1.0	-1.0	-0.4	-1.1
Austria	0.3	-0.6	-1.1	-0.4	0.0	-0.6	-1.0	-0.4
Portugal	-4.2	-2.7	-3.5	-3.2	-4.6	-2.5	-2.6	-2.1
Finland	5.1	4.7	3.3	3.0	4.2	4.8	3.7	3.3
EUR-12	-1.6	-2.2	-2.5	-2.4	-2.1	-2.2	-2.0	-2.0
Denmark	2.8	2.0	1.8	2.1	2.3	1.9	2.0	2.2
Sweden	4.5	1.3	0.8	1.2	3.6	0.9	1.1	1.5
UK	0.8	-1.3	-2.5	-2.5	0.7	-1.0	-2.0	-2.0
EU-15	-0.9	-1.9	-2.3	-2.2	-1.4	-1.8	-1.8	-1.8

NOTE: Cyclically-adjusted figures are computed with the Production Function Method, except for Germany, Spain, Luxembourg and Austria, where the Hodrick-Prescott filter method has been used.

SOURCE: Commission of the European Communities, *Communication from the Commission to the Council and the European Parliament, Public Finances in EMU - 2003*, p. 5.

Indeed, Europe is not the only place that takes this problem seriously. Most U.S. states limit their governments' own flexibility to run deficits and to borrow – and the Federal Reserve would not have it any other way.

But unlike Europe, restraints on the freedom of U.S. states to run deficits do not prevent automatic fiscal stabilization since the federal government can still run deficits during recessions. At the federal level, the free-rider problem undermining incentives for prudence does not exist; the domains of the Federal Reserve and the federal fiscal authorities are one and the same.

Once this rationale for the Stability Pact is made explicit, it becomes clear how many questionable assumptions must be made to justify the rule. Given the weight the ECB attaches to price stability, would the bank really be likely to respond to a national debt crisis with a significantly more inflationary policy? Would it really worry that a financial crisis in one country would infect neighboring markets? Or would it stand aside – as the Fed did when the government of Orange County in California defaulted on its bond obligations in the 1980s? Even if the ECB injected significant amounts of liquidity in response to a financial crisis, couldn't it simply reverse the process once the crisis subsided – neutralizing any inflationary effects in the way the Fed neutralized its expansionary operations in the aftermath of the Long-Term Capital Management crisis in 1998?

WHAT TO DO WITH THE PACT

Skeptics thus suggest that the Stability Pact should be abandoned. After all, it is not part of the Maastricht Treaty that authorized the establishment of the European Central Bank. It is an afterthought – and an ill-advised one at that.

Majority opinion in Europe has not yet reached this point. Most opinion leaders continue to take the free-rider problem seriously, worrying that, if unfettered, national governments would run reckless fiscal policies that become engines of inflation. Rather than abandoning the Stability Pact, they recommend revising it to allow budgets more flexibility to respond to the business cycle while

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maintaining the long-term commitment to fiscal discipline.

There is now a cottage industry cranking out proposals for reforming the pact. One popular scheme would use cyclically adjusted budget balance – the deficit that would exist if the economy were at full employment – rather than actual budgets in Stability Pact calculations. Others include exempting public investment from the 3 percent deficit ceiling, and more readily giving governments exemptions from that limit.

All these proposals would make it easier for deficit spending to rise when growth slows, freeing Europe from its fiscal straitjacket. But unless these reforms are accompanied by measures that significantly strengthen incentives to run surpluses in good times, they will also heighten worries about unsustainable debts and inflation down the road. However compelling the case for greater flexibility, EU leaders will remain reluctant to allow governments more freedom to run deficits in bad times unless they find a way of ensuring that they will run surpluses in good times.

Exempting public investment or focusing on cyclically adjusted budgets would do nothing to ratchet up the pressure to run surpluses in good times. Increasing the transparency of the European Commission's reviews of national fiscal policies in the hope of shaming profligate governments into compliance underestimates the capacity of national authorities to ignore criticism from those who can't vote them out of office. And, while popular among academics, the idea of assigning control of national fiscal policies to a committee of independent experts is social-science fiction.

The best hope is to encourage governments to reform their budgetary institutions. There is now extensive research linking the nature of fiscal institutions to fiscal outcomes. We know that countries in which the prime minister or finance minister has agenda-setting power in fiscal policy are less prone to chronic deficits. Countries in which states and provinces are not permitted to spend now and ask for bailouts later are similarly less deficit-prone. Moreover, countries that minimize the reach of publicly owned enterprises are less likely to find deficit-inducing fiscal skeletons in the closet.

If European economies changed their institutions to generate surpluses during booms, it would be practical to give them more freedom to run deficits in hard times. Such reforms are the responsibility of member states, not the European Union. But the EU could help by altering the focus of surveillance under the Stability Pact, giving less weight to numerical ceilings for deficits and more to the strength and design of policy-making institutions. The Stability Pact would then become an asset rather than an obstacle in the effort to enhance both fiscal discipline and fiscal flexibility.

MAKING MONETARY UNION WORK BETTER

Happily, there is evidence that reform of the pact is finally in the works. And there is hope from other directions as well. Following a garbled start, the European Central Bank has improved its communications strategy. It is getting better at preparing the securities markets for its actions and providing a convincing justification for them after the fact. The bank's executive board is learning the importance of having one individual – the president – speak for the institution. The bank is moving away from an incoherent "two pillar" strategy where it is supposed to simultaneously hit two moving targets – price increases and money supply increases – in favor of a

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simpler, more transparent and more credible inflation target. As its policies acquire credibility, it is showing an ability to respond faster to events.

To be sure, the ECB is still criticized for not reacting as quickly or communicating as clearly as the U.S. Federal Reserve. But the comparison is not entirely fair. At the age of five, the ECB is still feeling its way. When the Fed was five years old (in 1919) it still had not established that policy authority resided with the Federal Reserve Board in Washington rather than with the regional reserve banks. It had not even discovered "open market" operations in which the Fed buys and sells government securities to change private bank reserves and alter interest rates.

By this standard, the ECB is a quick learner. Moreover, there are grounds for thinking that the ECB will continue to grow more adept. A new bank president is likely to command more respect from the markets, while a rotation system for membership on the policymaking council will streamline the decision process.

The European economy also seems to be adapting to the fact of monetary union in ways that should make the single monetary policy work more smoothly. The previously divergent business cycles of the individual Euroland economies are beginning to converge. Labor mobility is rising, making it easier to adjust to shocks with localized impact on employment.

Faster structural reform of the European economy would also help, of course. The continent desperately needs more flexible labor markets and less government regulation. But the need for reform would be equally urgent if Europe had not adopted a single currency and single central bank. An economy suffering from structural rigidities and high labor costs will have high unemployment, whatever its monetary arrangement.

Europe's structural rigidities were not created by the central bank, and the central bank can do little to mitigate their consequences. Separate national monetary policies would do no better at restoring full employment and promoting faster growth so long as wages are not responsive to supply and demand, and regulation remains oppressive.

Some observers suggest that Europe's labor unions will become more flexible when they realize that there are no longer national central banks to bail them out with inflationary policies to offset wage increases in excess of productivity gains. But I wouldn't bet on it; exactly these arguments were offered when Argentina gave up its monetary autonomy in favor of pegging its currency to the U.S. dollar. The resulting increases in wage and price flexibility were much too slow to prevent the disastrous currency collapse in 2001.

The lesson is that structural reform must begin at home. It cannot be artificially stimulated by one monetary regime or another. More flexible markets would make life with monetary union significantly easier. But the euro is neither the cause nor the solution to Europe's inflexibilities.

THE CAMEL'S NOSE

Eventually, more liquid securities markets and more competitive product markets should make both European firms and the European economy more efficient. But even in the most optimistic scenario, the changes will take time to work their effects. In contrast, the euro's costs, in the form of a one-size-fits-all monetary policy and a rigid fiscal policy, are immediate and clear to see. In other words, while the costs of monetary union are immediately apparent, the benefits will accrue later.

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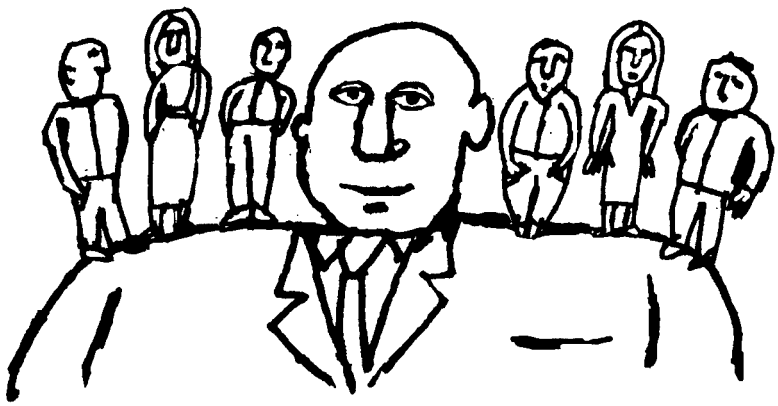

The bank's executive board is learning the importance of having one individual – the president – speak for the institution.

This, in turn, points to an enduring conundrum. Politicians have little incentive to practice delayed gratification on behalf of their constituents. A costly policy that promises benefits in the distant future rarely appeals, in part because there is no guarantee that the politicians will still be in office when the time comes to claim the credit.

This contradiction suggests that the decision to create the euro involved more than strictly economic calculations. Some of the euro's architects, notably Chancellor Helmut Kohl of Germany, clearly had in mind the political effects. For them, European economic and financial integration was a step toward political integration. Create a single market overseen by the European Commission and a single currency overseen by the European Central Bank, and there would be pressure to expand the powers of the European Parliament in order to create a political entity capable of holding the EC and ECB accountable for their actions.

The desirability of a more integrated European polity can reasonably be questioned – a wide majority of Swedish voters clearly questioned it by voting "no" on the country's recent referendum on the euro. Nonetheless, the advent of the euro and the ECB breathed new life to the arguments of those seeking a more integrated political architecture for Europe. In particular, it is hard to imagine that the European Union would have convened an unprecedented constitutional convention like the one that met in 2002-03 – much less taken the results seriously – in the absence of a monetary union that created a demand for new political structures to hold the European Central Bank accountable.

Americans like to spin tales of the coming collapse of Europe's five-year-old monetary union. But the fact that monetary union is part of a larger European project means that the euro is not going away. The euro union will not be jettisoned simply if it produces uncomfortable economic results, because it is not going to be judged by its members on narrow economic grounds. That said, anything the participants can do to make their new monetary arrangement operate more smoothly would be welcome. They should get to work. M

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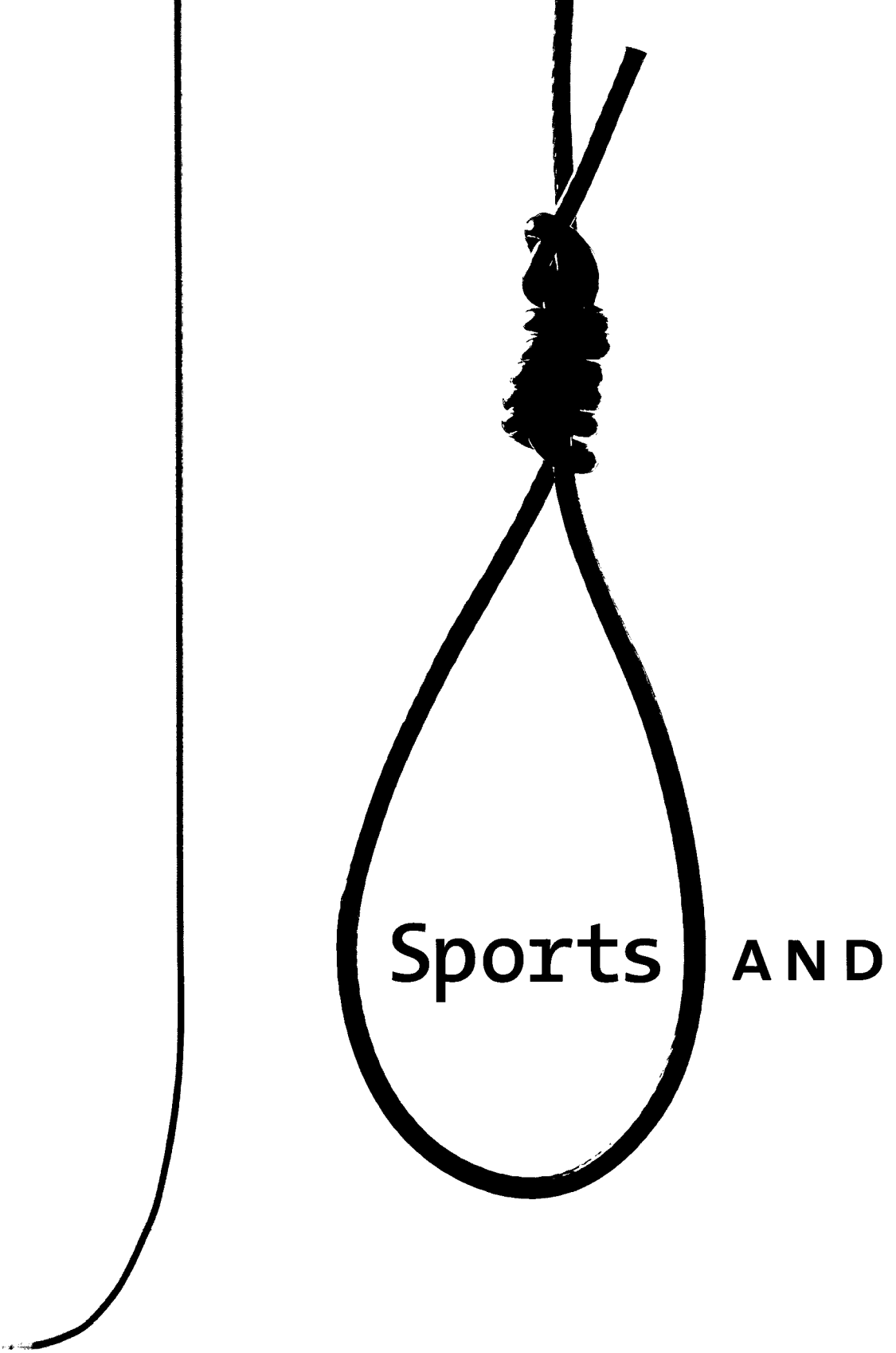

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Cable Television

Fox in the Chicken Coop?

By Andrew Zimbalist

Should the government level the playing field between major league sports teams, cable companies, sports networks and their customers? The prevailing wisdom about many things is, "if it ain't broke, don't fix it." But there is mounting evidence that the relationship between sports fans and the entities responsible for putting the games they want to see on the air is broken. And government may be the only player with enough clout to impose a solution.

Since the 1980s, telecasting of team sports in the United States has been migrating from free stations to cable TV. The trend affects both national and local television rights, and raises regulatory issues, because it has led to increased prices in some cases and lack of access at any price in others. Government intervention could certainly be rationalized – the market isn't working well – though the rapidly changing institutional and technological landscape complicates the implementation of specific policies.

MICHAEL SIPE (ALL)

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THE RUSH TO CABLE

The motive for a league or team to move from broadcast television to a cable network is straightforward: cable produces two income streams – advertising and cable carriage fees, while broadcast generates advertising alone. Indeed, in some smaller markets, a team may find it difficult these days to convince a broadcaster to pay significant sums for television rights. Baseball teams that control their own cable outlets – the Yankees, Red Sox, Braves, Dodgers, Phillies, Twins, Blue Jays, Orioles, Astros and Royals – have yet another reason to switch to cable: it gives them the ability to shelter income from Major League Baseball's revenue-sharing system.

In 1987, Major League Baseball teams, on average, broadcast 81 games locally on free television and licensed 35 more for cable viewing. By 2003, the numbers had practically reversed, with 41 games on broadcast television and 90 on cable.

By no coincidence, local Major League Baseball media revenues grew from a total of $117 million in 1985 to $655 million in 2002. Cable represents a growing slice of this ever-growing pie, escalating from roughly $200 million in 1999 to $350 million 2002. These estimates, by the way, are clearly conservative. Teams that own their cable or broadcast outlets can (and surely do) use accounting devices to divert revenue from the team itself.

Parallel economic forces are infiltrating other professional sports. During the 1997-98 season, National Basketball Association teams, on average, broadcast 31 games on free local television and 38 games on cable; three seasons later, the numbers were 28 for free television and 40 for cable. The shift in the NBA's national contracts has been more dramatic: in the deals expiring in 2001-02, 48 of 142 nationally televised regular-season games were on free TV; in the deals beginning in 2002-03, only 15 of 127 games were on free TV.

With hockey, 30 percent of national television revenues were cable-based in 1993-94; nine years later, this percentage had doubled. And the trend is even more pronounced with local media; during the 2000-01 season, close to 80 percent of televised NHL games were on cable.

The National Football League is a special case because there have been no regular-season contests broadcast locally since 1961. But even here, there has been a small movement of games away from broadcast to cable.

POOLED CABLE CONTRACTS: ARE THEY LEGAL?

In 1961, Congress granted sports teams a partial antitrust exemption to allow for league-wide packaging of national television contracts. The exemption blesses the leagues to function as cartels in selling over-the-air television packages to broadcasters. Specifically, the law allowed such packaging for "sponsored telecasting of the games of football, baseball, basketball or hockey."

But does "sponsored telecasting" refer only to over-the-air broadcasting, or to any telecasting that contains advertising? Cable television generally did not have advertising before the 1980s and the law's legislative history suggests that permission for package sales was granted in part to ensure that all road games would be televised back to the franchises' home areas. (This was necessary because the courts had ruled in 1952 that the home team has a property right in licensing the televising of games played in its park.)

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A cable subscriber lacking interest in sports typically can't opt out of sports channels nor switch to another cable system; of the 10,157 local cable systems in the United States, fewer than 100 have direct competition.

The House Judiciary Committee decided that "the public interest in viewing professional league sports warrants" an accommodation "with minimal sacrifice of antitrust principles." Since the law was meant to promote viewership, it would be inconsistent with the act's purpose to allow shifting of telecasting to cable. Indeed, during Congressional hearings on the bill, the NFL's commissioner, Pete Rozelle, unequivocally asserted that the legislation was not intended to apply to cable or pay TV. And in two subsequent legal challenges, the courts agreed.

Thus, the NFL, NBA and NHL national deals with cable stations and with the satellite system DirecTV are subject to antitrust review. By contrast, due to its presumed antitrust exemption, Major League Baseball's deals with ESPN and DirecTV, as well as its own streaming of games on the Internet, seem immune to antitrust scrutiny.

While this distinction between baseball and the other major professional sports leagues is significant in theory, to date it has not hampered the other sports leagues. The few challenges to pooled pay TV deals in the NFL and NBA have all been resolved with little sacrifice on the leagues' parts.

CHANNEL BUNDLING: IS IT LEGAL?

Cable companies bundle channels; what is known as expanded basic cable service usually offers 40 to 70 channels for a flat fee. These bundles include basic local broadcasting, national cable channels and sports channels. Generally, consumers cannot choose to buy a subset of the expanded basic offering.

Bundling (or tying) is considered a restraint of trade in many circumstances under the antitrust laws. The law may, however, allow it where competition ensures that consumers can opt out of bundles by purchasing from a different seller or where bundling creates efficiencies. Think of a restaurant that bundles an appetizer, main course and dessert, and passes on the savings in the form of a bargain prix fixe menu.

But with sports channel bundles on cable, consumers rarely have a choice. A cable subscriber typically can't opt out of the sports channels. Nor can he or she switch to another cable system; of the 10,157 local cable systems in the United States, fewer than 100 have direct competition.

BUNDLING AND ECONOMIC EFFICIENCY

Consider an example with one cable company, two consumers and three cable channels. The chart below shows the hypothetical maximum value to each consumer of each channel per year – and thus the most each consumer would pay to view them.

If the cable company could somehow manage "perfect price discrimination," charging each consumer the most he or she would

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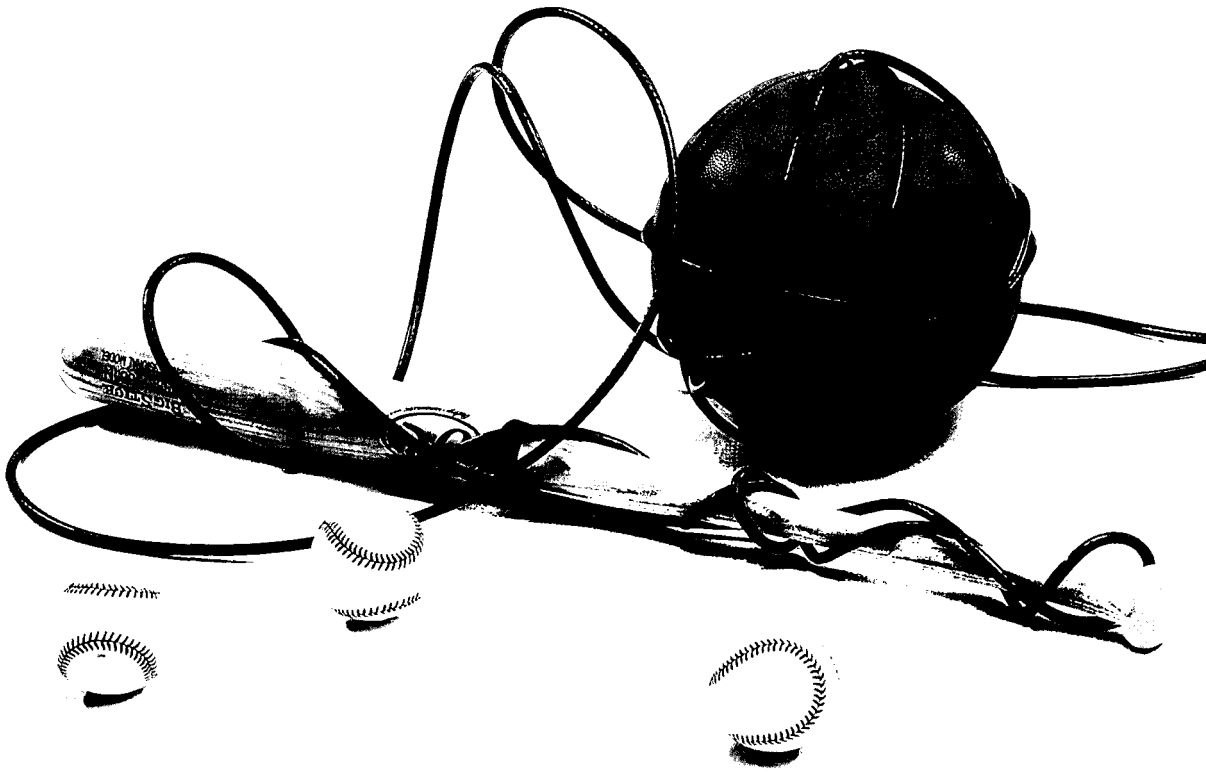

be willing to pay, it could earn $184 in yearly revenue from these two consumers. In the more plausible circumstance in which the cable company charged the same prices to both consumers, the most it could earn would be $128 (by charging $36 for channel A, $22 for channel B and $6 for channel C).

	CHANNEL A	CHANNEL B	CHANNEL C
Consumer 1	$70	$22	$6
Consumer 2	$36	$40	$10

On the other hand, if the cable company bundled the three channels as a package and charged a take-it-or-leave-it $86, both consumers would purchase it and revenues would total $172. Since the first option – perfect price discrimination – is not practical, bundling enables the cable company to increase its revenues very substantially.

"Chicago-school" devotees of efficiency see no loss and some possible gain from such bundling. First, they would argue that, from an efficiency perspective, it is immaterial whether economic surpluses – the differences between value and price on the one hand, and cost and price on the other – go to consumers or to producers. Second, they would claim that greater producer surplus may lead cable companies to expand output by adding additional cable channels that otherwise would not be profitable.

Now consider a more complicated example. Assume there are three consumers who value the channels as follows:

	CHANNEL A	CHANNEL B	CHANNEL C
Consumer 1	$70	$22	$6
Consumer 2	$36	$40	$10
Consumer 3	$40	$0	$0

In this example, perfect price discrimination would generate $224 in revenues (just

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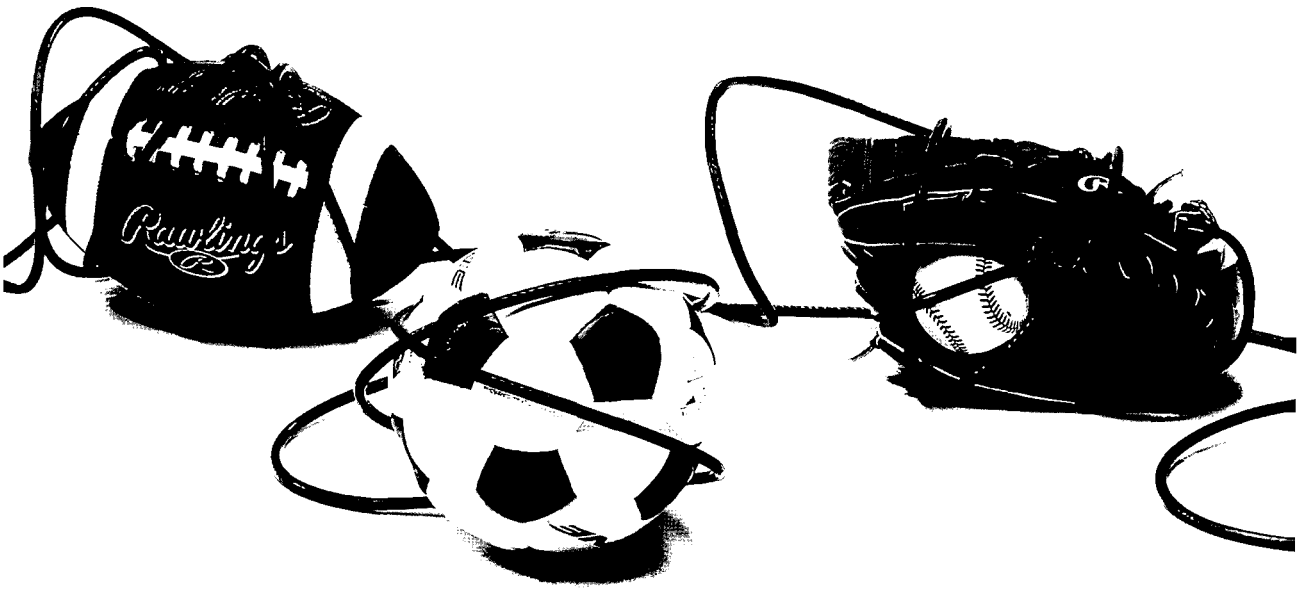

add up the nine channel values). Regular, uniform pricing would generate $164 (by charging $36 for channel A, $22 for channel B and $6 for channel C). However, if the cable company were able to price channels as a take-it-or-leave-it bundle, it would set the price for all three channels at $86, selling the bundle only to consumers 1 and 2, and earning $172. Eliminating service to consumer 3 lowers output – and efficiency in the economist's classic sense of the word – because it would presumably cost nothing to provide services valued at $40 by consumer 3.

Again, assuming that the marginal cost of distributing the cable signal is zero, the total surplus generated with perfect price discrimination is $224 – all of which goes to the cable company. With bundling, consumers come out ahead by $12 (the difference between what they pay and what the bundle is worth to them), while the cable company generates a surplus of $160. The total (consumer-plus-producer) surplus is $172.

Note the contrast. With uniform pricing of channels and no bundling permitted, consumers come out ahead by $60 and producers come out ahead by $164; everybody gets to watch and the total surplus is $224. Thus, in this example, prohibiting bundling both leads to greater efficiency and directs more of the surplus to consumers.

This example makes it useful to look again at the Chicago-school claims regarding bundling. First, bundling is only efficient (that is, it generates the most net value) if consumer preferences are ordered in a certain way.

Second, the notion that bundling simply creates an efficiency-neutral transfer from consumers to producers is only true if it does not affect consumer behavior. Yet if the aggregation of bundling leads to higher prices, it may well reduce consumption and output. And even if consumer behavior is unaffected by bundling, there is still a question whether

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it is fair to consumers.

Third, there is a legitimate question – assumed away in this example – about whether the cost of delivering the service to an extra consumer is, indeed, close to zero. From the perspective of the cable operator with spare capacity on the system, adding one more channel to an expanded basic package will equal the per-subscriber fee charged by the channel. This fee presently ranges from negative (when channels offer bounties to cable operators for carrying a signal) to about $3 per month. From the perspective of the cable operator without spare capacity, the additional channel may necessitate the use of new cable boxes or even a new digital delivery system. The cost then is hardly zero.

From the perspective of society, the cost of adding another channel is the resources used by the channel. If this cost is greater than the value it creates for consumers, efficiency is diminished. A significant, dominant issue here is that, with channel bundling, the choice to allocate resources is not really made by the consumer. This challenges basic notions of how one maximizes welfare.

If the television consumer could choose between a prix fixe menu and a la carte offerings, the efficiency concerns would be alleviated. Yet, the vast majority of communities do not have effective competition among pay-TV providers. Whether this continues to be the case may well be decided by the Federal Communications Commission – and, of course, the courts' reaction to the FCC's policies.

PAYING THE CABLE MONOPOLIES

The 1996 Telecommunications Act deregulated rate-setting in cable (beginning April 1999) on the theory that there would soon be stiff competition. This competition was expected to come from the law's relaxation of the prohibition against telephone companies' offerings of cable service, as well as from the growth of direct broadcast satellite (DirecTV and EchoStar). But, as of early 2002, competition from the telephone companies had materialized in only a handful of markets.

According to a 2002 study by the Federal Communications Commission, in places with competitive cable distributors, average prices on expanded basic service were 6.3 percent lower. Further, where there was competition, more channels were offered on the expanded basic package, so that the average price per channel was 9.4 percent lower. The U.S. General Accounting Office's own study in 2002 suggested this figure was higher: head-to-head cable competition reduced prices by about 17 percent.

Some competition has come from satellite services. But satellite is not available everywhere, and the FCC found that the service did not have a significant impact on the price of cable. Not surprisingly, then, since the passage of the 1996 Telecommunications Act cable prices across the United States have gone up at three times the rate of inflation.

To a large degree, these increases have been driven by the ever-higher prices charged by sports programmers (the national cable stations – like ESPN, TNT or TBS – and the regional sports networks). ESPN, for example, writes long-term contracts with cable companies that allow it to raise prices 20 percent annually. The net cost to the cable companies for ESPN is now between $1.60 and $1.85 per subscriber per month.

The programmers, in turn, are selling access to games of teams that have territorial exclusivity in local media markets conferred upon them by monopoly sports leagues. In most areas, there is only one regional sports network. Typically, then, we have a monopoly (a team) selling to a monopoly (a sports

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Typically, we have a monopoly (a team) selling to a monopoly (a sports channel), which sells to yet another monopoly (a cable company), which then sells to the public. The consumer is playing against a stacked deck.

channel), which sells to yet another monopoly (a cable company), which then sells to the public. The consumer is playing against a stacked deck.

Back in 1992, in an effort to protect local broadcasters from the growing power of cable companies, Congress mandated "retransmission consent." A local broadcaster can either require the local cable company to add its station to the basic package ("must carry") or it can require the cable company to obtain its consent to carry the channel.

But some of the consequences have been unintended. The network companies (GE/NBC, Disney/ABC, Viacom/CBS, News Corporation/FOX, Time Warner/WB) own local affiliate stations covering between 35 and 45 percent of U.S. households. Since the 1992 retransmission-consent law and the subsequent relaxation of rules prohibiting cross-ownership of broadcast and cable channels, the national network companies have bought up and created dozens of leading cable channels; 20 of the 26 top-rated national cable channels are owned by a national network company. Overall, the national networks control at least 50 cable channels.

Thus retransmission consent gives the networks significant economic power. It is common for the networks to require the cable companies to carry their cable channels at charges above market value in exchange for the right to carry the network signal. Through retransmission consent, the network companies are indirectly forcing cable viewers to pay for "free" television.

THE TANGLED WEB OF VERTICAL INTEGRATION

Ownership of a sports team can generate the programming around which a media company can build a regional sports network. This option is especially alluring if it also prevents rivals from building competing regional networks. Indeed, Rupert Murdoch acknowledged that a decisive payoff from purchasing the Los Angeles Dodgers was that it deterred Disney from creating a rival to his two regional sports networks in southern California. (Though, apparently there is a price at which Murdoch is prepared to part with the team – as this was being written, Murdoch's News Corporation reached an agreement to sell the Dodgers.)

Regional sports networks can be valuable properties, particularly in large markets. The News Corporation's Fox Sports Net 2, which carries both the Angels and the NHL's Mighty Ducks games, is estimated to be worth between $200 million and $300 million. New England Sports Network, which is 80 percent owned by the Red Sox, has been valued as high as $350 million. The Yankees Entertainment and Sports (YES) network was implicitly valued at a minimum of $850 million when Goldman Sachs purchased 40 percent for

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$350 million in 2001.

Sports teams may derive yet more value from spawning regional sports networks. First, by forming such a network or threatening to form one, the team stands a better chance of receiving market value in selling programming rights to a monopoly cable operator. Second, a team that owns the regional sports network will receive market value through its sale of advertising spots during games and the carriage fee it charges the cable distributor. And as a bonus of sorts, a team owning a regional sports network may report the revenues as income to the network rather than to the team itself.

This option has a number of potential benefits. It makes the team appear less profitable – a possible advantage in bargaining with the players. Poverty (by accounting definitions) can be used in negotiations with a municipality to obtain public financing for new stadiums. And, as noted earlier, it can be used to reduce a baseball team's revenue-sharing obligation.

Yet while vertical integration can be valuable to sports teams, it is often bad news for consumers. Consider the dispute between Cablevision and YES over the carriage of New York Yankees games on expanded basic cable.

Cablevision is a vertically integrated company, owning or co-owning multiple cable distribution companies, two New York City regional sports networks (MSG and Fox Sports New York) and two teams (the NBA's Knicks and the NHL's Rangers). Cablevision's chairman, Charles Dolan, was less than pleased that his company, MSG, had lost its telecasting rights to the Yankees and that his bid for the Red Sox was not accepted even though it was some $90 million above the next highest bid. But more important, Dolan was not pleased at the prospect that his two New York City regional sports networks were going to face strong competition from the upstart Yankee Entertainment and Sports network.

Dolan's Cablevision faced no meaningful competition in selling cable TV services to some three million of the nearly eight million cable subscribers in the New York City media market. It had raised its monthly rates on its expanded basic package from $21.95 to $46.65 between 1993 and 2003.

Dolan's Cablevision has enjoyed monopoly power by (a) owning the only two regional sports networks in the New York City area until YES was launched in early 2002, (b) controlling the local broadcast rights to all professional sports teams in the greater New York City market, and (c) owning teams in two monopoly sports leagues. Yet when asked to pay $2 per subscriber to carry the YES network on its expanded basic package – something that the three other cable distributors in New York City and dozens more in the outer market agreed to – Dolan was born again as a populist.

He argued that it was unfair to bundle YES with the basic package and raise the rates of all subscribers because not all were Yankee fans. Of course, by this logic, Cablevision should also cease to carry ESPN, CNN, TBS, BET and a host of other cable channels on Cablevision's basic package. Indeed, for consistency, Cablevision should not have put its own regional sports networks (MSG and FSNY) on the expanded basic package in roughly half of its New York markets.

Pseudo-populism demands sacrifice: Yankees fans in the Cablevision area missed 130 games during the 2002 season. Market power, then, led not only to higher prices and less output; for three million New York households in 2002, it led to no output at all.

An interesting ancillary effect of this dis-

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pute arises because Cablevision is in partnership with the News Corporation, which, in turn, owns the Los Angeles Dodgers, a competitor of the New York Yankees. The Dodgers not only potentially compete with the Yankees on the field, they also – along with baseball's other teams – compete with the Yankees as the team that has most aggressively pushed the player payroll envelope.

AT&T Broadband, the largest cable provider in Portland, Ore., refused to accept its asking price – a comparatively modest 50 cents per subscriber per month. And faced with requested price increases of $1.50 to $2.20 per subscriber per month from FSN North in Minneapolis, Time Warner chose to drop the channel. FSN North holds the cable rights to the NHL's Wild, the NBA's Timberwolves and

Similarly, the Yankees co-own the YES network via a holding company with the NBA's New Jersey Nets. The Nets were contracted to show 73 of their 82 games in 2002-03 on the YES network. By refusing to carry YES on its expanded basic tier, Cablevision was able to derive a competitive advantage for its NBA team, the New York Knicks, over the New Jersey Nets. The NBA league office had nothing to say publicly about this apparent conflict of interest.

Cablevision's resistance to YES seems to have catalyzed a broader revolt against sports programmers. The Action Sports Cable Network went dark in November 2002 after Major League Baseball's Twins. Nearly 200,000 households lost cable access to the local professional hockey, basketball and baseball teams until a compromise was hammered out.

In Orlando, when the Sunshine Network sought a 40 percent rate increase (to $1.26 per subscriber per month), Time Warner pulled the plug on the network in January 2003. Over 700,000 households lost cable access to the NBA's Magic and the NHL's Lightning games for three months.

WHAT MUST (MIGHT?) BE DONE

The sports network wars have reached the

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courts. Yankees supporters unsuccessfully sought an injunction to force Cablevision to carry YES on basic cable. New Jersey's attorney general, David Samson, threatened to bring an antitrust suit against Cablevision. YES itself filed an antitrust action against Cablevision.

And legislatures have waved the stick as well. Faced with the prospect that Yankees games would be lost to New Jersey's Cablevision households for a second season, New Jersey's State Assembly voted 47 to 20 to compel Cablevision to carry the YES network.

Some members of Congress have planned hearings to consider intervention in the cable market. "I'm not sure an 80-year-old woman who subscribes to cable should have to pay for ESPN," explained Arizona Senator John McCain. "I think something ought to happen. I don't know if it's competition; I don't know if it's reregulation," he said. "But the status quo is very unacceptable."

What practical steps could be taken? First, the FCC could reverse its current course and begin to promote competition among cable providers in individual markets. This could be accomplished by requiring cable distributors to provide physical local loop access to competitors – as was done in the telephone industry.

The alternative is to wait for direct broadcast satellite to become a major source of competition. But DBS is inherently limited by buildings and natural obstruction in many areas, and cable companies' ability to discount service packages including telephone and broadband Internet service could prove a formidable competitive barrier in others.

Another option, suggested by the recent Cablevision/YES agreement for the 2003 season, is to compel some level of debundling. Cablevision has agreed to offer YES in three ways: as part of a more expensive expanded basic service package, as part of a modest sports package including MSG and FSNY, or, as a standalone channel for a modest $1.95 a month.

While the simple hypothetical examples above illustrate that bundling can increase efficiency in some cases, it seems very likely that Cablevision's 2003 unbundling will increase consumer welfare. Subscribers who are not baseball fans are not required to pay to watch the local teams. Yankees fans pay just under $2 per month on Cablevision, which is roughly what they pay (as an add-on to the bundle price) to the other distributors in the New York area. (Anomalously, Mets fans will have to pay either $4.95 monthly for all Mets and Yankees games or $3.90 for all Mets games – because Mets games are now split between MSG and FSNY.)

A complementary strategy would be to extend unbundling to include the national sports channels, like ESPN and its various offshoots, as well as Fox Sports. The package of ESPN channels can now cost over $9 a month, and another fat increase was recently announced.

Of course, radical remedies are, in theory, available. They include public provision of cable services, or the re-establishment of price controls over cable monopolies. Alternatively, the limitation of the 1961 exemption to free television could be enforced, subjecting all sports package cable and DBS deals to antitrust scrutiny. Territorial and league monopolies could also be challenged.

Rapid technological change is making new products and delivery systems more viable with each passing year. And while these unpredictable changes make it problematic to prescribe specific policies, the value of competition at the delivery, programming and production levels is plain. M

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Saving Capitalism From The Capitalists

BY RAGHURAM RAJAN AND LUIGI ZINGALES

In the early 1990s the great, century-long competition between economic systems ended with a whimper. Communism imploded; the guys with the Adam Smith neckties won. ¶ Or so it seemed at the time. But a decade of dislocation – everything from the meltdown of the Asian economies to the exposure of rot in America's corporate boardrooms – has illustrated all too clearly that it takes more than faith to make free markets work. For, like communism, capitalism contains the seeds of its own destruction. Hence the timeliness of *Saving Capitalism From the Capitalists: Unleashing the Power of Financial Markets to Create Wealth and Spread Opportunity**, the striking new book by Raghuram Rajan and Luigi Zingales. ¶ Rajan, incidentally, will have an unusual opportunity to test the merits of his recommendations: he has just been appointed the chief economist and director of research for the International Monetary Fund.

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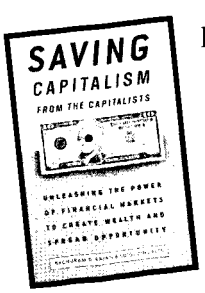
SAVING
CAPITALISM
FROM THE CAPITALISTS
UNLEASHING THE POWER OF FINANCIAL MARKETS TO CREATE WEALTH AND SPREAD OPPORTUNITY

— *Peter Passell*

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For nearly two centuries, scholars and politicians have debated the future of capitalism. Its critics, most prominent among them Karl Marx, have seen capitalism as intrinsically unstable, full of contradictions that will lead eventually to its collapse. Its supporters see it as the best way to allocate resources and rewards. Some even hint that democratic capitalistic society is not just a phase in the evolution of economic systems but its ultimate end. In the middle are all those searching for a "third way," a kinder and gentler form of capitalism or a more market-driven form of socialism.

Our view, which draws in many ways from a long tradition at the University of Chicago, has elements in common with all these positions. We do think that capitalism – more precisely described today as the free enterprise system – in its ideal form is the best system to allocate resources and rewards. But the forms of capitalism experienced in most countries are very far from the ideal. They are corrupted versions of it, in which vested interests prevent competition from playing its natural, healthy role. Many of the accusations against capitalism – that it oppresses workers, that it creates private monopolies, that it is only an instrument for the rich to get richer – relate to the corrupted, uncompetitive systems that exist rather than a true free enterprise system.

We do not believe that capitalism is fundamentally flawed; markets can be given the political support to remain free. Much of this book is about why that support is necessary: markets cannot flourish without the very visible hand of the government, which is needed to create and maintain the infrastructure that enables participants to trade freely and with confidence.

But who has an interest in pushing the government to support the market? Even though everyone collectively benefits from the better goods, services and equality of access that competitive markets make possible, no one in particular makes huge profits from keeping the system competitive and the playing field level. Thus, everyone has an incentive to take a free ride and let someone else defend the system.

A competitive market is a form of public good (a good, like air, that is useful but hard to charge for), and somewhat paradoxically, collective action is needed for its maintenance. Given its dependence on political goodwill, democratic capitalism's greatest problem is not that it will destroy itself economically, as Marx would have it, but that it may lose its political support. Capitalism's biggest political enemies are not the firebrand trade unionists spewing vitriol against the system, but the executives in pin-striped suits extolling the virtues of competitive markets with every breath while attempting to extinguish them with every action.

Adam Smith recognized the inexorable tendency toward suppressing competition

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when he wrote, "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices." Unfortunately, all too often and in all too many countries, the conspiracy enlists the help of the state in enforcing limitations on competition.

Marx also understood that capitalists would enlist the state in securing their position when he and Friedrich Engels wrote in *The Communist Manifesto* that the government is essentially "a committee for managing the common affairs of the whole bourgeoisie." But he thought that the problem was specific to bourgeois democracies and would disappear in a socialist state. Unfortunately, all the socialist revolution did was to change the identity of the elite and strengthen its hand by eliminating not just economic competition but all semblance of political competition.

All the socialist revolution did was to change the identity of the elite and strengthen its hand by eliminating not just economic competition but all semblance of political competition.

Free enterprise capitalism is not the final stage of a deterministic process of evolution. It is better viewed as a delicate plant, which needs nurturing against constant attack by the weeds of vested interests. It is useful to consider where the weeds might spring from, for that will help us build the appropriate defenses.

The market is threatened by two diverse groups: the incumbents, who want to retain their position and thus have a strong incentive to suppress any potential source of competition, and those who lost out, who would be happy if the rules of the game that caused their troubles were changed. The long-term feasibility of free markets rests on reducing the incentives of each of these groups to proceed against the market, and limiting their chances of success if they do proceed.

The way to limit the chances of success of vested interests is not to expand the power of the state but to narrow its ability to take inefficient economic actions favoring the few at the expense of the majority. In the same way as inefficient economic entities are forced to improve by competition, inefficient governments can be forced to improve, not so much by competition in the political arena, where the committed few can organize and thwart the will of the majority even in a democracy, but by forcing their subjects to compete in the economic arena.

A powerful device to achieve this is to open borders to the flow of goods and especially to the flow of capital. The country's capitalists will then feel the impact of bad government policies, and they will become a force for good, market-liberating reform. The shift over the past 30 years from centrally managed, relationship-based economies with heavily controlled financial sectors to free market economies with vibrant financial markets can be attributed to both increasing trade and increasing financial flows.

But open borders themselves spawn political opposition. Technological change and in-

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creasing international competition will create entirely new categories of the distressed. Can the political opposition be contained?

Before we describe the looming challenges, it is useful to see an example of how economic institutions can adapt to defuse the incentives of interest groups to coalesce against market forces. Consider the evolution of the U.S. bankruptcy code in the 19th century. The economic role of bankruptcy law is not just to provide a mechanism for creditors to collect their money, but also to offer a form of insurance to debtors, relieving them from some of their burden when it becomes overly oppressive. When a borrower owes so much that he has small hope of repayment, he will have little incentive to exert effort to earn money; any extra dollar earned will simply go to creditors.

A modern bankruptcy code provides a mechanism by which debtors can get relief. In providing this flexibility, bankruptcy legislation somewhat paradoxically enhances the security of property in two ways. First, it allows creditors to charge up front for the possibility that they will have to offer relief, thus protecting their property. At the same time, it heads off any need for debtors to organize politically, preventing them from arbitrarily wiping out their debts. This further enhances the security of property and the sanctity of contract.

Through much of the 19th century, federal bankruptcy laws were enacted in response to harsh business conditions, only to be repealed soon after. But periodically violating creditor rights was no panacea. What guarantee was there that organized debtors would stop at repudiating their current obligations? Could a debtors' revolt not spread to questioning other forms of property? To leave relief to concerted political action was tantamount to playing with fire.

A better solution eventually emerged. As financial markets and institutions developed, as information and communications technology, like the telegraph, knit the country together (so that, for example, debtors could not escape the stigma of bankruptcy by going West), as markets for assets improved in liquidity, creditors became better able to monitor their loans and obtain repayment. Some permanent leniency was possible. This is why there was a broad trend in the legislation that was contemplated over the 19th century. The bankruptcy laws that were enacted, albeit for short periods, became progressively friendlier to debtors, encompassing more of them and giving them more relief.

The point is that there are solutions that help keep the sphere of markets and the sphere of politics separate while recognizing the imperatives of both. In considering some of the coming challenges, it is important to think of creative ways of managing the implicit tussle between free markets and politics so that one does not destroy the other.

THE POLITICAL ENVIRONMENT AND THE COMING CHALLENGES

Recent corporate scandals and suggestions of extensive conflicts of interest among the guardians of trust in the market – the accountants, investment bankers and analysts – are forcing people to ask the age-old question of whether there are in fact two tracks in the market economy, one for the very rich and one for everyone else. The $735 million earned by Gary Winnick, the CEO of Global Crossing, while his company was heading toward bankruptcy, the $112 million earned by Jeff Skilling, president and CEO of Enron, in the three years before his company collapsed after being accused of phony accounting practices, the $240 million earned by Tyco's Dennis Kozlowski before he was fired and accused of tax fraud, undermine the faith

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people have in the fairness of the market.

It is not that people are concerned about disparities in wealth; very few Americans question the enormous amounts earned by superstar athletes like Michael Jordan and Tiger Woods. They can observe Michael Jordan's superior talent firsthand, and they are willing to accept that he deserves what he makes. In the boom years, this was also true for corporate America. But corporate disasters like Enron or Global Crossing have undermined the belief that corporate leaders deserve what they make or that financial analysts really understand the stocks they tout, creating room for envy and resentment. It is in these situations of public mistrust of market forces that foes of free markets find it easier to coordinate and act.

The public resentment in the current economic downturn feeds into a long-standing distrust of markets embodied in the anti-globalization movement. While some of this

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movement is age-old protectionism in a new-age guise, there are also many groups involved that genuinely perceive global markets as unfair. Not all these groups understand what they are protesting. Some long for the things the modern economy appears to crowd out (such as time, friendships, family and conversation) and the things it appears to destroy (such as open spaces and a clean environment). It is change that they fear, and globalization is unfortunately the most visible and rapid form of change in recent times.

More discerning protesters see that the inadequate infrastructure countries have for coping with globalization's adverse consequences, rather than globalization itself, is the problem. But it is easier to make common cause against globalization than to focus on the more mundane task of fixing the infrastructure. Already, politicians are responding in the natural way to the downturn by erecting tariff barriers and offering domestic

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subsidies, a way that is not only shortsighted but also completely oblivious to the lessons of history.

The steel tariffs in the United States were followed by a farm bill that substantially increased the level of subsidies available to the agricultural sector. This will inevitably enrage developing countries, which would willingly forgo all the foreign aid developed countries offer if only the developed world would reduce the extent to which it pampers domestic agricultural sectors. Developing countries will respond by being more reluctant to lower their tariff barriers, for unfortunately, history suggests that protectionism is contagious.

We are in a dangerous period of hangover, the morning after the ecstasy of a boom. Many feel betrayed by the bust and are demanding action against the markets. Even when the economy picks up, as sooner or later it inevitably will, new challenges are coming that will cause severe dislocation in society. These could be exploited by the few to constrain the market, so it is important to understand what they are.

TECHNOLOGICAL CHANGE

For centuries, technology has created new products and new ways of making them that render workers and their skills redundant. While the dislocation stemming from technological change is not new, its pace has increased tremendously. Moreover, it is now affecting the professions that have not much changed their way of doing business over the centuries. Because it will affect those who have not yet learned to fear for their jobs, its political impact will be all the more severe.

Drafting, for example, used to be a significant component of an architect's job. Computer-aided design software has made this skill all but irrelevant. Older architects now find themselves at a serious disadvantage relative to younger colleagues who have been taught to use the software as an integral part of design. Even if older architects do not draft anymore, their ability to supervise and coach their younger colleagues is much diminished. In the race for career advancement, an entire generation has been handicapped.

Other jobs are vanishing because customers now have access to information and transactions technology to which only intermediaries had access earlier. Stockbrokers used their privileged access to research reports in order to entice customers into maintaining trading accounts with them – in the process, generating large brokerage fees. Now, Internet brokers offer all the research customers need and charge minuscule trading commissions.

Travel agents are also finding business increasingly difficult as customers not only have access to the same information they command, but can sometimes get better rates directly from airlines and hotels. This does not mean that all stockbrokers and travel agents will vanish overnight. However, many will not survive, and the ones who do will work very differently from the way they work today.

Technology is also having a differential impact within professions. Take our own: teaching in universities. Using new communication techniques, one gifted professor can teach students in many locations around the country. While technology will increase the demand for such superstar teachers, it will reduce the demand for the merely good, and the demand for the mediocre may vanish completely.

Not only is technology making certain human skills obsolete quickly, it is creating entirely new sources of distress. As research into genetics progresses, scientists will more easily identify those who are likely to die of particular diseases at a young age. This knowledge

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has important benefits. It alerts individuals to warning signs and lets physicians diagnose and intervene more quickly. But those who are identified as highly prone to debilitating diseases will find it hard to keep jobs that involve substantial training by their employers, or to get insurance, or even to maintain normal social relationships.

Imagine that you receive bad news from the medical lab: you have a genetic predisposition to a debilitating, irreversible disease. Though you may feel fine now, you anticipate a bleak economic future. You have everything to gain, and nothing to lose, by seeking redress through political action. You will be unlikely to settle for handouts if there is a possibility of suppressing the disease-identifying technology. (Simply leaving it up to the individual to disclose if she chooses is tantamount to giving her no choice. Those who test well will disclose their results, with the implication that anyone who does not disclose is predisposed to disease.)

If you achieve a ban on the technology, you restore the status quo ante – and your fears about getting health insurance and good jobs will evaporate. That society will be worse off today, and that pharmaceutical firms will not get the data to help future generations, will not particularly concern you – after all, for most sufferers, the gain will far exceed any sense of altruism they might have lost.

The fear that political constraints may be placed on the use of valuable new technologies is not unfounded. Twenty-one states in the United States already restrict the use of genetic records for employment purposes, even though genetics technology and the debate about its use are still in their infancy.

COMPETITION FROM EMERGING ECONOMIES

China and India, accounting together for more than 2.5 billion people, are finally on the move. Never before in history have so many people become wealthier at such a pace. While the peoples of these and other developing countries will add to the global economic pie in many ways, they will also compete for jobs that they can do more cheaply and more efficiently.

The challenge from emerging economies is not unrelated to the challenge from technology, for technological advances will lead to competition in sectors that hitherto were immune. Consider that a typical secretary in New York is about as well educated and productive as a typical secretary in Mumbai, India. They use the same word processing and presentation software, the same fax machines, the same e-mail programs to communicate over the Internet. The secretary in New York, however, makes about 13 times the salary of her Indian counterpart.

The reason for this difference is that secretarial work has, thus far, been protected from foreign competition. Immigration controls and perhaps an affinity for being in Mumbai keep the Indian secretary far from New York. Thus, her willingness to work at a lower wage has little effect on the wages of secretaries in New York.

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This is not to say that secretarial wages are determined arbitrarily. Like all prices, they are determined by supply and demand. One factor determining the supply of secretaries is their alternative employment possibilities. Suppose a secretary's alternative is to be a steelworker. There is a world market for steel (provided protectionism does not close it down), so no country can afford to pay its steelworkers much more than what they contribute at the margin to output. U.S. steelworkers are paid much more than Indian steelworkers because U.S. steelworkers are substantially more productive. Therefore, because U.S. steelworkers are more productive, the U.S. secretary is paid more, even though she herself is not more productive. Thus, in the United States, the secretary earns a hefty salary because she controls a scarce factor: specialized labor.

But what is scarce here is secretarial labor in the United States, not secretarial labor in the world. And technology is increasingly making it possible for all kinds of labor to be supplied at a distance. As the cost of communication falls, a Chicagoan complaining about his utility bill is just as likely to find a middle-aged woman in Manila on the other end of the line as an American.

Not every job will be at risk. But, over time, competition will move to more skilled activities as foreigners learn the local standards. While large firms may still employ partners in big accounting firms to advise them on arcane tax-minimization strategies, the small-business owner may well deal over the Internet with an Indian or a Chinese accountant who has familiarized herself with U.S. laws. A Russian physician may perform an operation over the Internet at a fraction of the cost that a Western European physician would charge.

In short, while workers in "traded" industries like steel have faced up to foreign competition for decades and have adapted to it, for many in "non-traded" service sectors, this will be something they have never experienced before. They currently enjoy compensation in excess of what they would earn in a worldwide competitive market. An increase in competition will jeopardize this excess compensation. Hence, like the steelworkers, these new victims of competition will mobilize to try to block it. But unlike the case of trade in physical goods, border controls will be ineffective.

THE FEAR OF DEVELOPED ECONOMIES

Even while developed countries fear competition from cheap, skilled, educated labor from developing countries, the latter fear that their industries could be wiped out by multinationals with global brands. In the same way workers in the developed world see cheap labor in the developing world as an unfair threat (no matter how much this fear is disguised as concern for the working conditions and benefits of developing-country workers), owners and managers in the developing world see the better infrastructure in the developed world as unfair.

In truth, each side has a source of comparative advantage, which will help it compete. And in a world of open borders, each side can benefit from the other's strengths – the developed world getting access to cheap labor and the developing world getting access to infrastructure. But all this implies dislocation and distress in the short run. And the developing world is even less prepared than the developed world to handle it.

In some developing countries, the preconditions for respect for property or for creating market infrastructure have not yet been established. Property is highly concentrated in the form of large feudal landholdings or

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monopolies, especially in extractive industries. Not only can these countries not cope with volatile, competitive markets, but their dominant political groups have little interest in creating the infrastructure that would allow them to cope.

One reason many firms in developing countries are inefficient, despite their access to cheap labor, is that they have been protected against domestic and foreign competition and have consequently become slow and lazy. Equally important, however, these firms are not managed by the best talents available.

To obtain the management they need in an increasingly competitive world, firms must look farther and wider, and dispense more quickly with managers who are not up to the mark. But such a change requires an outsider-dominated governance system; it is easier to fire top managers when they do not control a large fraction of a firm's voting rights and when they are actively monitored by outsiders on the board. Unfortunately, these are not the conditions prevailing in most of the world. Many companies are controlled by insiders, who acquired that right at birth rather than in the marketplace.

In a rapidly changing world with immense dislocation, such entrenched management is likely to have strong incentives to co-opt the distressed into demanding protection. A classic example of such an organization is what is loosely termed the Bombay Club in India, an amorphous organization led by the scions of the old, venerable business families that strongly oppose opening up the economy.

Another serious concern in developing countries is the near-complete absence of a formal safety net for those hurt by competition. In developing countries, transfers and subsidies represent just one-fourth the proportion of the budgets in developed countries. Until the Asian crisis in 1997, even South Korea had little in the way of unemployment compensation and had to institute such a scheme rapidly when faced with worker demonstrations.

As developed and developing economies become more intertwined, not just through trade in goods but through services, they are becoming more exposed to disturbances in each other.

In part, the low level of social spending reflects a belief that the role of the government is only to create market infrastructure, while social networks provide insurance against adversity. This belief has served countries well during periods of rapid economic growth. But with the expansion of the market economy, social networks tend to break down; Singapore passed legislation in the 1990s empowering parents to sue children who did not support them in their old age!

Legislation, however, is unlikely to fully repair social bonds that have been sundered by the market. The developed world has to care about these vulnerabilities in the developing world. As developed and developing economies become more intertwined – not only through trade in goods but also through services – they are becoming more exposed to disturbances in each other. Moreover, as trade moves from manufacturing to services, the

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degree of mutual dependence and specialization is likely to increase; it is arguably harder to change your accountant or the firm that maintains your system software than to change the firm from which you purchase steel. It is also hard to build inventories of services to act as buffers.

There is a silver lining to these interdependencies. When, in May 2002, the governments of India and Pakistan started threatening each other with nuclear war, businesses in both countries became alarmed at the possibility that foreign buyers would get scared off by perceptions of increased risk. As a result, they pressured their governments to tone down the rhetoric. These benefits notwithstanding, growing global integration is exposing the world to new risks of disruption that have to be addressed.

AGING POPULATIONS

No analysis of the potential future threats to the political viability of free markets can ignore the dramatic effects that the rapidly aging population in developed countries will have on the distribution of resources. In 1970, there were 17.2 million children under age five and 3.7 million adults over 80 in the United States. By 1995, the figures were 19.6 million and 8.1 million respectively, and by 2040, they will be 25 million and 26.2 million respectively. The United States, with substantial immigration, is not even close to being the most rapidly aging country. By 2010, Japan will have fewer than three working-age adults for each elderly citizen, and by 2050, it will have only 1.5 taxpaying workers per pensioner. At that time, Italy will have fewer taxpaying workers than pensioners.

A smaller and smaller working population will have to support a larger and larger group of the non-working. If no change occurs, future working generations will pay ever more to the elderly while expecting ever less for their own old age. This will set up a clash of interests between the incumbent old and the younger working generation, between those whom democracy renders powerful because of their numbers and organizational power and those whom economics renders powerful because of their control over human capital. Historically, a mismatch between political power and economic power has represented a threat to the security of property rights. Such a threat is possible again in the future.

Another source of tension arises from the international distribution of resources. If the productive capabilities of the economy fall as the population ages, goods for consumption will have to be imported. Developed economies will have to invest abroad – not in other developed economies, as has been the trend in the past but in younger, developing countries. Developing countries need to build the capacity to absorb these investments in sensible ways.

Moreover, if developed countries are to hold significant quantities of financial claims on developing countries, they will demand safeguards to ensure that they will not be dispossessed at a later date when they need to cash in those investments. Historically, respect for property rights emerged when owners were sufficiently represented politically to make expropriation politically difficult and when expropriation hurt the expropriator in the long run. Clearly, investors from developed countries have had little or no political representation in developing countries, at least since the days of gunboat diplomacy.

So whether their rights will be respected hinges on whether, going forward, developing countries will find it costly to expropriate owners in developed countries. Population aging will force developed countries to be

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increasingly reliant on respect for property in developing countries. It is in our collective interest that market infrastructure expand worldwide.

INTERNATIONAL GOVERNANCE

We have argued that the cause of markets is aided within a country if its large industrial and financial firms are competitive, for they will then not have to rely on shackling the free market to survive. Internationally, the cause of free markets is helped if the dominant political power is also an efficient producer, for it then will press others to open up their borders.

During the 19th century, England promoted free markets around the world. A similar role has been played by the United States in the post-World War II era. It is periods when the political leadership of the world changes hands or when the dominant political power loses its economic leadership that we are especially likely to face ambivalence about open markets.

The United States is still the dominant economy in the world as well as the sole superpower, but neither attribute is immutable. Certainly, with the steel tariffs and the farm subsidies, we see the consequences of U.S. economic weakness in some sectors impinging on its commitment to open borders. What if weakness spreads? Will the United States continue to champion free markets?

Of course, the United States is only one country. Competition among different political entities can still further the cause of the market even if a major player jumps ship. The danger here is the growing political integration among countries of the type occurring in Europe. It reduces political competition and makes coordinated antimarket moves more feasible.

In its early years, what is now the European Union was the European Economic Community (EEC) – a focused attempt to break down national barriers in Europe to enlarge the market. When it was largely intent on a pro-market goal, it was a force for the good, and coaxed many countries to liberalize. In ensuring equal access to foreigners, countries also were forced to level the playing field for their own citizens, thus fostering the development of competitive arm's-length markets.

However, as the aims of the European Union have broadened to a common program of governance, its directives could well have the potential of becoming more intrusive and illiberal. Consider an extreme but illustrative case. Suppose after a severe stock market crash, the European Union decides that too many companies brought to market were little more than a dream and a prayer. It decides to tighten the rules under which companies can issue shares on the market, a move incumbents might well support because it starves entrants of capital. Given that these rules would apply immediately in all neighboring country capital markets a new European firm might think of tapping, that potential entrant might be hard-pressed to raise finance under the new rules.

By contrast, if a single country tried to impose those rules, it would see the potential entrant go to a neighboring country to raise finance. Thus, the migration of business to friendlier political entities is a very strong disciplinary force for keeping policies market-friendly. This force is suppressed when neighboring political entities coalesce.

SAVING CAPITALISM FROM THE CAPITALISTS

There is no magic bullet. A call for forceful action by the government runs the risk that the action will be distorted by incumbents. A call to neuter the government runs the risk

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that the necessary infrastructure will remain underdeveloped and the market will be exposed to political backlash during the inevitable cycle of business creation and destruction. The only way out consists of initiatives that can check and balance each other so that the government supports, but does not intrude on, the functioning of the market. In isolation, each proposal may seem benign or even counterproductive. But together, they become a force to foster free markets.

will always apply. But the nexus between economic and political power is of special concern in two situations.

If a few incumbents have much of the economic power, they can rely on their own political clout to achieve business ends and will feel little need to establish transparent rules that make markets accessible to all. This is more likely to be a problem in a country that does not have an established market infrastructure because the pressure to create

No matter what kinds of campaign finance reforms are enacted, some form of the real-world "golden rule" – he who has the gold makes the rules – will always apply.

Our proposals rest on four pillars. First, it is important to ensure that the control of productive assets is not concentrated in a few hands, and that those who do have control also have the ability to use the assets productively. Second, a safety net is essential for the distressed – one that does not simply help people to cope with business cycle downturns but makes it possible for them to bounce back from the loss of a career. Third, the scope for political maneuvering can be limited by keeping borders open. Finally, the public should be made more aware of its stake in the market and what the costs of seemingly innocuous anticompetitive policies can be.

Reduce Incumbents' Incentives to Oppose Markets

We cannot wish away the fact that economic power translates to political power. No matter what kinds of campaign finance reforms are enacted, some form of the real-world "golden rule" – he who has the gold makes the rules – it will then be low. More dangerous still than this benign neglect of the market is if the incumbents are incompetent at business, for they may then suppress the competitive market so as to preserve their own positions.

The two concerns are not unrelated. The diamond trade in India is dominated by a small community of Palanpuri Jains from Gujarat. For nearly half a century, these traders have worked in secrecy, dealing largely with other members of extended families, to buy, cut, polish and resell diamonds around the world. Working without legal contracts, they have been so effective that nine out of 10 diamonds in the world now pass through India.

The reason this system has worked so far in a country with a creaky legal system is that it is based on trust. The community ostracizes anyone who violates the implicit understanding among traders. The problem, however, is that outsiders cannot participate in the system, and insiders have no incentive to create

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a more arm's-length, transparent system; it is easier to build trust when profits are large and trading is confined to a well-known few.

The concentration of trading in a few hands can be harmful if the system stops working, as well. And there are signs of this as trade expands and business has to be done with more and more outsiders: a courier recently absconded with $10 million worth of diamonds, and two Bombay traders lost their clients' money in stock speculation (they were so ashamed, they committed suicide). But members of the community are not eager to accept modernization and professionalism, however necessary, because these changes will also bring competition.

Change is therefore coming slowly, perhaps too slowly. The point: concentration of economic power, even if currently benign, need not remain benign, especially if the privileged few have their own ways of doing business. This suggests two goals of policy: to keep economic power from becoming overly concentrated and to ensure that those who control economic resources are capable of using them efficiently.

These goals are often, but not always, compatible. For example, it is clear that a policy of subjecting firms to competition from the outside helps keep them efficient. There is little pressure on a protected industry to become competitive, and it will use the windfall profits earned while being protected to lobby for more protection instead of taking the steps necessary to restructure. The Indian Ambassador automobile (a version of the ancient British Morris Oxford) was introduced in 1957 and was sold virtually unchanged until 2002 because it had little domestic (and no foreign) competition during much of its history. Even an allegedly temporary pause in market discipline, such as the recent imposition of steel tariffs in the United States, risks creating incumbents who will fight to make the barriers permanent.

A Political Antitrust Law. Antitrust law has been used to prevent firms from squeezing supernormal profits out of customers. But it is also useful to consider the political version of antitrust law – one that prevents a firm from growing big enough to gain the clout in domestic politics to suppress market forces.

There are obvious problems in framing such a law precisely, but it has been implicitly in place in the United States for some time – especially in finance. The attack on the Second Bank of the United States by Andrew Jackson in the 1830s, the breakup of John D. Rockefeller's Standard Oil in 1911, the creation of the Federal Reserve in 1913 to counter the power of the House of Morgan, the Glass-Steagall Act of 1933 to curb the power of the large national banks, and the ongoing case against Microsoft can all be seen as consequences of political antitrust law.

Better Corporate Governance. Some of the most important properties in advanced economies are not operated by their owners but rather by professional managers. We refer, of course, to corporations. On the one hand, the separation between ownership and control facilitates a better matching between firms and managers, leading to more efficient firms. On the other, it creates conflicts of interest between managers and shareholders, potentially leading to inefficiencies.

To facilitate a healthy separation between ownership and control, more legal protection should be guaranteed to investors who entrust their savings to somebody else. In addition, appropriate mechanisms, such as independent boards, effective auditors and a vibrant market for corporate takeovers, are essential to ensure that managers are coaxed into maximizing the value of the companies they run, and are quickly replaced when they

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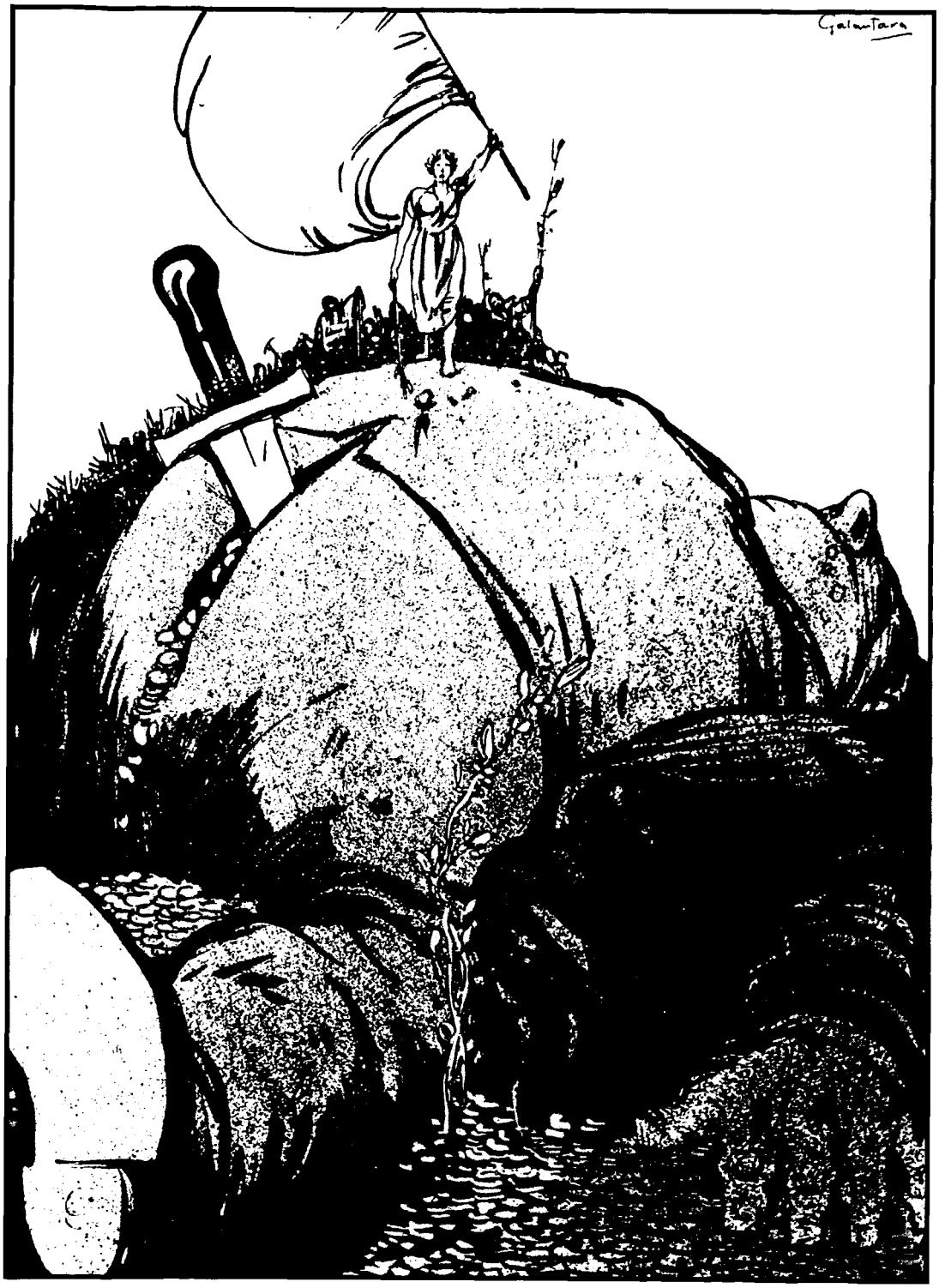

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demonstrate their inability to do so.

In other words, corporate governance is important not only to enhance value for investors, but also to ensure that incumbent firms welcome (rather than) fear competition. Recent scandals suggest that much needs to be done on this front even in advanced market economies.

Inheritance Tax on Transfer of Control. Inheritance is a particular form of transfer of control of assets that typically tends to be inefficient because the receiver has little qualification to manage the assets other than the accident of birth. Imposing serious impediments on how the rich dispose of their wealth would reduce their incentive to create that wealth in the first place. Inefficient and concentrated control of wealth does, however, impose all kinds of costs on society. That is why an inheritance tax, structured so that the rich are encouraged to transfer passive ownership of productive assets (for example, minority stakes in a portfolio of firms), rather than active control, to their children would make sense. Inheritance taxes may be especially important in developing countries where there is immense concentration of landholdings.

Another way to break down the excessive concentration of asset ownership is to make equal inheritance by all children, male and female, the default. Such prescriptions are not new. They can be traced back at least to the British philosopher James Harrington, who had tremendous influence on William Penn (and thence on the Constitution of Philadelphia), on Thomas Jefferson (and thereby on the Constitution of Virginia), and on Theodore Roosevelt (and thus on federal antitrust legislation).

A Safety Net for the Distressed

Competition triggers failures. These failures are essential to the creative destruction process, but are extremely painful for the people affected. The bigger the cost of adjustment and the larger the numbers of the distressed, the stronger the political demand to intervene.

Insure People, Not Firms. While perfectly understandable, this demand for intervention is very dangerous because it can be easily manipulated. To prevent the victims of creative destruction from being transformed into human shields for special interests, we need to provide for them in other ways. One rule, therefore, to prevent the politicization of relief is to insure people directly – not through firms.

For example, economists generally agree that the best way to provide relief to workers who lose their jobs is to offer them lump-sum payments, perhaps dependent on the duration of their previous employment. Not only does this not interfere with the competitive process, but also it gives workers the right incentive to look for new jobs (they get to keep the payment regardless of how long it takes) while relieving them of the privations of unemployment. Unfortunately, such simple solutions are rarely implemented because they disassociate worker relief from politics.

Design Insurance Before the Fact. Governments typically prefer to wait for an event before responding instead of preparing for the uncertain eventuality; not only can the magnitude of the relief required be better gauged after the fact, but also resources do not have to be held in reserve. One reason to design relief in advance is simply that a plan provides people a greater sense of security. Moreover, it eliminates the need for the distressed to organize to obtain relief. Since their collective actions are not likely to be friendly to the market, a plan for relief before the fact eliminates a significant threat to the markets.

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This, in fact, is suggested by our brief account of the evolution of U.S. bankruptcy law. Once a flexible law was put in place, the need for debtors to organize to press for relief during each recession disappeared. Also, they could obtain relief based on individual circumstances, rather than wait for collective misery to tip the political scales. Relief provided after the fact is not insurance but pure redistribution. As such, it is driven solely by the political power of the parties involved, not by the needs of people.

Insure Against Permanent Change. Social welfare programs were designed to fight the last wars – notably, temporary dislocation caused by business cycles. Structural change, not cyclical change, is the primary concern now.

Peoples' most valuable assets are typically their productive skills. To develop flexible human capital a worker needs sound health into old age, a basic general education that gives him the ongoing ability to learn rather than filling him with facts with a very short half-life, and an education system that can take him in whenever he needs retraining.

In the United States, life expectancy has increased by 29 years since 1900. Yet most people stop formal education early in life, much as they did a hundred years ago. Education is still geared toward that first job, even though technological change, competition, and greater job mobility mean that for most people, the first job (or even the first career) will not be the last. Would it not make more sense to cut back a little early on and have more opportunity for education later?

Finally, it should be possible for those with neither the desire nor the ability to make career changes to retire. A viable pension scheme would allow this. Unfortunately, the generations coming of age today, when the risks of structural change are so great, have little reason to feel secure about their pensions. With pay-as-you-go financing, the aging of populations means that the social security systems currently in place in almost every developed country will prove inadequate.

There are few formal systems of insurance in place in developing countries; these countries rely on social networks like extended families and villages to serve as buffers to economic volatility. The silver lining is that the level of government expenditure on social security in many of these countries is still low. So they have the ability to create formal security systems without repeating the mistakes made by developed countries.

Reduce Incumbents' Ability to Affect Governance

Thus far, we have proposed ways of reducing the incentives of incumbents and the distressed to go against markets. We now turn to measures that would reduce their ability to affect governance.

Open Goods and Capital Markets. The most effective way to reduce the power of incumbents is to keep domestic markets open to international competition. It is especially important to keep financial markets open. Countries have little incentive to close their borders to trade and capital flows unilaterally when the rest of the world is open. This is because goods and capital will leak through anyway unless the country goes the totalitarian route of a North Korea. But a mass movement against open borders, even if only in a few large countries, can make it attractive for politicians to close borders.

This is the danger posed by the growing antiglobalization protests. Economists have responded to these protests by emphasizing the productivity gains generated by international trade. However, they have generally been lukewarm in their support for the free

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movement of capital. While we certainly do not dismiss the importance of the efficiency gains generated by trade, we emphasize a different argument in favor of openness – its capacity to undermine the power of domestic incumbents. A commitment to openness forces incumbents to abandon politics and to focus on the tougher task of defending their positions in the marketplace by becoming more efficient.

While openness is clearly beneficial for developed economies with sound infrastructure, sudden liberalization can be problematic for underdeveloped economies. Subjecting ill-prepared economies to the gale-force winds of international competition can be harmful because it may wipe out the very constituencies – the professional classes, small- and medium-size entrepreneurs, commercial farmers – that can push for a market economy.

According to some, the right policy for the large developing economy is to limit competition until the institutions necessary for an efficient market economy are in place. But there is a great risk in such gradualism: slowing down the liberalization process may bring it to a standstill. If incumbents know that opening up to competition hinges on improvements in infrastructure and skills, they can block movement on either front.

In fact, while gradualists argue that financial-sector reforms should precede the open capital flows, in practice they seem to follow it. So the dilemma for a reformist government in a developing country is how to create a commitment to increase competition while allowing time for market institutions to be built.

Provide Incentives Through Trading Zones. Richer countries, which have come together in free trade zones, have a very powerful instrument to encourage (rather than to force) reforms: offer membership in their trading zones, conditional on progress on market infrastructure development. By using the carrot of the opportunity to trade with a large group of countries (like the European Union or Nafta), they make reform politically appealing for the developing or transition economy. It is impressive how much Turkey is trying to change (with respect to human rights as well as economic structure) in order to qualify for membership in the European Union.

There are, of course, countries that do not fit naturally into a trade zone. But the broad principle of providing incentives for reform still applies. Developed countries could do a great deal for the cause of markets, both in their countries and around the world, by stopping subsidies to their own farmers and by lowering trade barriers in key goods like textiles. Farmers and small entrepreneurs in developing countries, who have a better chance of growing rich if protectionism in developed countries is reduced, can be a great force for opening markets in their own countries – just as their counterparts were in the developed world.

PUBLIC AWARENESS

Throughout, we have argued that organized interests drive government policies. One reason politicians can ignore the public interest with impunity is that they believe the public is unaware of what its interests really are and cannot be bothered to find out. Our goal is to make more people think like economists do. If they see the benefits of free markets, yet understand their political fragility, it will be harder for narrow interest groups to prevail. It will become easier for public-spirited politicians – there are some – to advance sound reforms. And the world will become a fairer and better place. M

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BY GLENN YAGO AND SUSANNE TRIMBATH

Firms offering new technologies, old industries seeking new life and whole countries emerging from underdevelopment or socialist planning all require access to capital. Indeed, perhaps now more than ever, creating more efficient ways of channeling savings to investment is central to progress.

AP/WIDE WORLD PHOTOS

Trading stocks in Mumbai.

Happily, the high-yield markets, on which marginal-credit risks depend, have grown deeper and more sophisticated. Junk in name only, a bewildering variety of private equity deals, asset-backed securities and other derivative securities are now part of the diversified portfolios of institutions and individuals.

But the path to capital market innovation is still littered with potholes. With the U.S. economy hovering between recession and growth since the end of the long bull market,

GLENN YAGO is director of capital studies and SUSANNE TRIMBATH is a senior research economist at the Milken Institute. Their book, *Beyond Junk Bonds*, was recently published by Oxford University Press.

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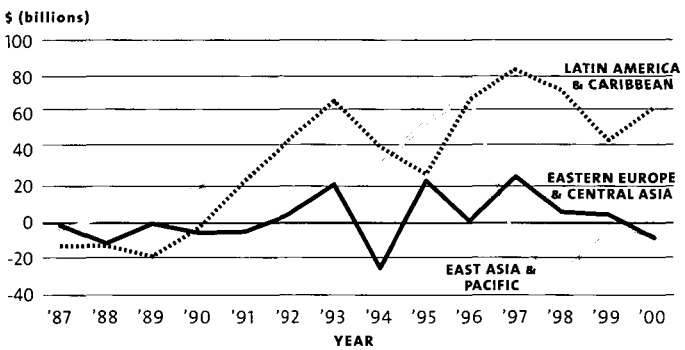
investors in virtually every class of assets have grown wary. By the same token, the prospects of the global economy seem increasingly uncertain. Thus, extending the logic of financial innovation to new markets and assets is a significant challenge. Here we summarize what we have learned from recent experience about the new financial technologies and how they might best be applied to current challenges.

NET CAPITAL FLOWS TO EMERGING MARKET COUNTRIES



SOURCE: IMF, International Financial Statistics

The new financial technology has many parents. The hands-on application of the insights of Michael Milken and his colleagues and competitors made a big difference. So, too, has the diffusion of critical research by Merton Miller, Harry Markowitz, Harry Sharpe, Michael Jensen and many others. The question now is how the lessons from this immensely productive body of work can be applied where they are needed most.

WHAT HAVE WE LEARNED?

The emergence of high-yield markets and the explosion of financial innovations to support them were critical to the corporate finance revolution that heralded the longest period of continuous economic growth in the 20th century. Maintaining the pace of financial innovation may well be key to continuing growth in the face of structural changes in markets, global financial instability and fresh concerns about the efficiency of corporate governance.

In the last three decades, control of capital in America shifted decisively from very large, private lenders toward more competitive, decentralized public capital markets. This democratization of capital meant that entrepreneurs need no longer depend on an elite class of gatekeepers. A market-based system with thousands of institutional buyers has eclipsed banks in the financial services industry. This broadening and deepening of the market has been extraordinary, though not without growing pains in the form of defaults, flawed capital structures and unanticipated vulnerability to external shocks.

The switch from bank-based to market-based finance has proved profound. For not only has the change widened access to capital, it has forced the major players to confront failures in financial disclosure and corporate governance.

Emerging economies must be transformed by ongoing innovation in financial technology the way communications have been transformed by digital technology. Indeed, the implementation of new financial technology has become a necessary condition for escaping dependence on foreign aid, government debt and remittances from expatriate workers.

YIELD GAPS AND THE ROLE OF THE HIGH-YIELD MARKET

After nearly two decades of rich returns in domestic equity markets, we seem to be entering an environment in which yields will

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need to be more closely linked to the rate of growth of economies than to corporate profits. Accordingly, a gap between the expected return on equities and the return needed to meet long-term liabilities in pension funds is emerging.

Pension funds must earn an average annual return of 8.8 percent to meet their current obligations. While a combination of domestic equity and fixed income easily provided this return in the recent past, asset managers must now look to other investments. Changing portfolio managers' mindsets isn't easy. As Mark Yusko, chief investment officer at the University of North Carolina, writes, "institutions sometimes accept serious risks in more widely held asset classes, such as small cap equities or emerging markets, while overlooking strategies that exhibit sound returns and lower risk."

So, where is the beef? Here, we review areas of potential growth in emerging overseas markets, emerging domestic markets, environmental finance and the securitization of intellectual capital.

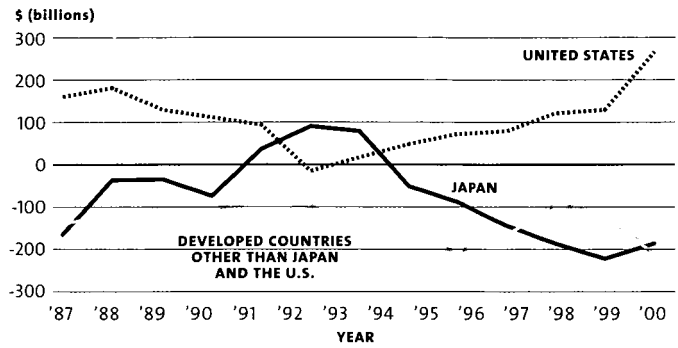
MISSING MARKETS

At present, capital flowing into emerging markets is volatile and relatively short term. In most, inflows have yet to be restored to levels before the Asian currency crisis. And in some, flows remain negative.

One consequence is that small- and medium-size enterprises have largely been denied access to the vast pool of savings of developed countries. This situation persists because the much-needed reforms to market regulation and to the governance of firms in emerging economies have yet to take place. Entrenched managers and elites in developing countries have in most cases been able to block reforms that would decentralize political and economic power by creating efficient capital markets.

Expanding economic participation in both home and business ownership is key to the expansion of output in developing economies.

WHERE THE FLIGHT CAPITAL WENT



SOURCE: World Bank, *World Development Indicators*

Middle-class oriented development, financed through the democratization of capital, not only will create a constituency for reform, but also will be the best guarantor of geopolitical stability. And despite the difficulties of the past years, the time is ripe for change; countries with a combined population of some 1.5 billion have already achieved levels of GDP comparable to those at which the U.S. and other countries first enacted middle-class oriented policies.

CAPITAL FLOWS

The Asian crisis of 1997, the collapse of the ruble, the subsequent shocks to Brazil and Ecuador, and, most recently, the collapse of Argentina's dollarization policy, have collectively curtailed appetites for investing in emerging market countries (EMCs). Indeed, each of the three large regions of EMCs –

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Eastern Europe, Asia and Latin America – has seen a collapse in capital flows since 1997.

THE IMPORTANCE OF FINANCIAL INFRASTRUCTURE

Growth in jobs, income and wealth are all closely tied to the status of both financial institutions and markets. Having a well developed financial system, as measured by the ratio of credit volume to GDP, has also been found to be negatively related to economic volatility. Capital markets and access to them are key for mobilizing savings, minimizing investment risk over time and across industries, monitoring managerial behavior and processing information for efficient asset pricing.

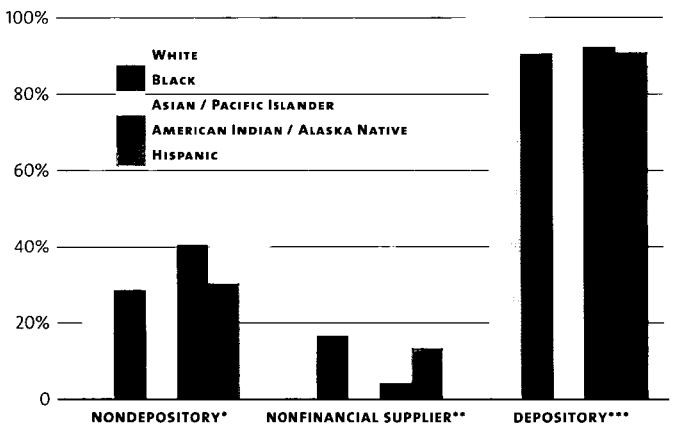
A deep and liquid financial system that facilitates broad economic participation favors the rise of a middle class and tends to reduce income inequality. For example, the development of commodities futures markets would allow farmers in poorer countries to protect themselves against the idiosyncratic risks of farming, just as their American and European peers are able to do.

Domestic financial intermediaries and markets in developing countries are often small and weak. And a small, weak market is equivalent to the absence of a market. Small markets have not only higher unit operating costs, but are also more risky. Less liquidity leads to excessive volatility as prices fluctuate in the absence of market makers. Inefficient markets combined with insufficient and poor quality regulation, ineffective supervision and weak enforcement invite chaos, including the potential for bank and market runs.

Building local and regional markets requires widespread participation by issuers, investors and intermediaries. It also requires building the necessary market infrastructure of reporting, information flows and rules for corporate governance. These emerging and transition markets are important not only because their absence undermines economic and political stability in an increasingly interdependent world, but because they have most of the world's population and should account for most of the world's growth over the next few decades. Capital flows within and between those markets and the developed world have become increasingly important – not only to fund growth but also to generate high returns to pension funds in a rapidly aging developed world.

The emergence of primary and secondary high-yield securities markets would help pro-

SMALL BUSINESS'S SOURCES OF FINANCIAL SERVICES, BY ETHNIC GROUP



*finance company, brokerage, leasing company, other
**family and individuals, other businesses, government
***commercial bank and thrift
SOURCE: Survey of Small Business Finance, Federal Reserve Bulletin (2001)

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vide a benchmark for pricing credit risk, bank loans and public securities for domestic and foreign investors alike. The development of these markets would allow the transfer of risk through securitization. Repackaging loans and selling them as bonds would reduce emerging market banks' exposure to liquidity risk and mitigate maturity mismatches for financing institutions in these countries as well. Funding costs for entrepreneurs and consumers would fall.

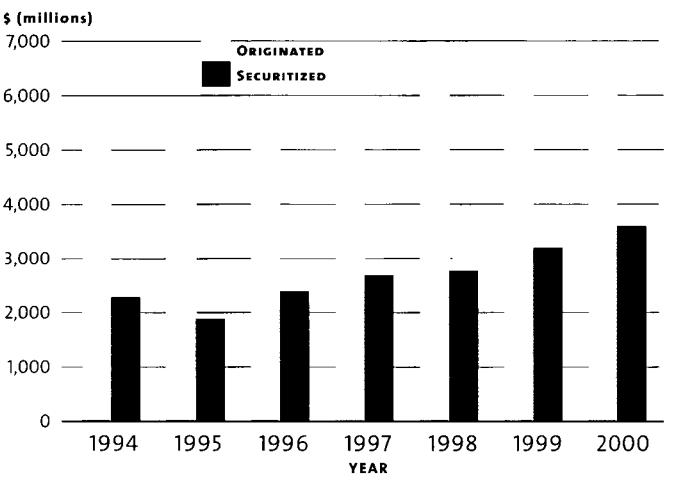
EMERGING DOMESTIC MARKETS

The United States faces its own challenges in sustaining and broadening economic prosperity at home. Given the rapid rate of minority population growth, the success of the economy is increasingly tied to the success of minority entrepreneurs. The size distribution of minority-owned businesses reflects the distribution of all U.S. firms and overwhelmingly represents small businesses. Accordingly, the capacity of the business system to regenerate turns, in part, on the capacity of minority entrepreneurs to climb the success ladder. Research on failure rates indicates that, controlling for education, capital access and management experience, businesses survive and prosper irrespective of the ethnic origin of the firms' entrepreneurs. Thus, what amounts to extending civil rights into the economic sphere is sound policy in terms of economic efficiency.

Perhaps as important as the growth in the number of emerging domestic market (EDM) firms and their sales volume is their broader distribution across industries. Not long ago, minority ownership was largely concentrated in personal services firms. Today, however, the distribution of minority-owned businesses roughly mirrors the distribution of all U.S. businesses. Significant concentrations exist in construction, wholesale trade, transportation, communications and utilities, with an increasing focus on export opportunities. Within the service sector, minorities show particular strength in the high-growth/high-skill health and business services, and engineering and management categories. In finance, insurance and real estate, we find increasing numbers of securities and commodities brokers, and both depository and nondepository institutions.

However, the vast majority of smaller EDM firms do not have access to the financing technologies that have fueled mainstream growth. In 1999, firms focusing on traditionally undercapitalized minority entrepreneurs managed only 2 percent of private equity funds. The disparity between capital demand from EDM firms and capital availability is a

SECURITIZATION OF GUARANTEED PORTION OF SBA LOANS



SOURCE: Small Business Administration

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serious constraint on expansion.

New research suggests that use of debt and equity as means of financing small businesses is positively correlated. That is, they are complements, not substitutes, in the context of small-firm creation; a strong balance sheet increases access to institutional sources of credit.

In recent years, institutional investors have become increasingly interested in emerging domestic markets. Some are using traditional fund managers to develop investment prospects, while others work through banks and still others invest through minority-focused funds. As in emerging markets overseas, effective investing requires a combination of general investment expertise and strong ties to local market partners.

Between 1990 and 2000, the capital invested in EDM funds rose from $550 million to $3.4 billion. As significant, the number of investment funds rose – from five sources of capital in 1990 (with the federal government providing 70 percent of invested funds) to nine in 2000 (with only 19 percent of the money coming from the government).

STRUCTURED FINANCE FOR EDM

One example of a risk management structure that applies the logic of structured finance vehicles to the emerging domestic marketplace is the state capital access program (CAP) – the type of small-business lending programs now running in 22 states and two cities. CAPs offer a mechanism for lending to small businesses that would otherwise be shut out of the market. Any federal- or state-chartered bank, savings association or credit union is eligible to participate in a CAP.

To create a link between private capital markets and the CAP program, California passed legislation in 1999 permitting the securitization and sale of CAP loans as asset-backed bonds. The U.S. Congress passed legislation in 2001 authorizing $200 million to be appropriated for a national CAP reserve.

EDM firms have already been able to float high-yield securities in the entertainment (particularly radio), communications and retail sectors. Innovative structured finance technologies make effective portfolio diversification possible, minimizing risk while still capturing market returns. Indeed, there has already been some progress in the securitization of Small Business Administration loans.

ENVIRONMENTAL FINANCE

To buttress a sustainable environment, we need to apply financial technologies that help to value environmental resources and to internalize externalities. Options, futures, hedging strategies and a variety of hybrid instruments that evolved in more traditional financial markets can be adapted to the purpose. Indeed, the creation of instruments that finance environmental investment and maximize the shareholder value of environmentally based enterprises is long overdue.

The rise of these markets also creates opportunities for emerging market countries, whose natural resource base gives them a comparative advantage in what might be called "environment-intensive" output. We would argue that monetizing environmental assets could substantially increase income and wealth generation in poorer countries.

Over the past 10 years, progress has been made in extending the benefits of new financial technologies to the solution of large-scale, persistent environmental problems. Applying the principles of corporate finance and economics to environmental issues shows how the alignment of the interests of consumers, producers and society can result in improved environmental outcomes. And in

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many cases, the creation of liquid markets in pollution rights has demonstrated that the cost of reducing emissions is far lower than engineering studies predicted. Market mechanisms allow polluters to meet their emission reduction commitments themselves – or to pay others to do the job where it is cheaper.

The adaptation of financial technologies to environmental problems is promising on a variety of fronts. Among the prospects:

- The expansion of markets in emissions permits to cover more pollution categories.
- The development of ecosystem services markets, which would monetize the value of biodiversity, ecotourism, etc.
- The development of market-based indicators to track environmental quality.

On first look, the use of markets to fix environmental problems seems unrelated to the traditional issues of financing economic growth. In truth, the factors that promote environmental sustainability affect the sustainability of corporations as well. Environmental and corporate performances are positively correlated.

INTELLECTUAL CAPITAL SECURITIZATION

Old models of capitalism were built around the control of tangible capital. A relatively small number of capitalists marshaled a society's physical assets and labor force to make things. Mass production by hierarchical firms using homogeneous labor and capital inputs was the order of the day. In modern models, economies run largely on ideas and the ability to finance them. Scale economies have given way to scope economies in the technological evolution of processes and products. Organizational pyramids have been flattened.

Capital spending that used to be concentrated in long-lived tangible assets now sustains rapid product cycles in knowledge-based industries. But by most analyses, investment in R&D, as well as in basic science, is well below the level needed to maximize growth. Government spending for science has not kept up with historical rates of increase and consolidation in some industries (e.g., pharmaceuticals) has compromised research and development budgets. Consequently, we may not be renewing assets in science and technology at a rate required to generate anything close to optimal economic growth.

Factors that promote environmental sustainability affect the sustainability of corporations as well.

In the late 1990s, businesses began to appreciate that intellectual property and technology-in-progress represented important assets. Early stage corporate, small business and university technologies have attracted unprecedented attention, valuations and investments.

Yet while the potential inventory of intellectual property and knowledge capital has continued to grow, supplies of capital (public and private) contracted after the stock market meltdown of 2000. Financial technology can help to close the gap – for example, by pooling and diversifying risk in projects to commercialize inventions. Securitizing intellectual property assets for purposes of trading them on into liquid, secondary markets may well prove critical. M

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SIGN OF THE TIMES

Growing metropolitan areas with diverse, stable economies – not the booming high-tech "new economies" of the 1990s – are the big winners in this year's Milken Institute Best Performing Cities index. The index measures performance by a variety of criteria, including job and income growth, and the pace of business startups.

Unlike past years in which technology-oriented metros dominated the top of the ranking, this year's leaders have all earned their high marks the old-fashioned way – with growth in traditional sectors like retailing, health care and defense.

The top 10:
Fayetteville, Ark.
Las Vegas, Nev.
Fort Myers, Fla.
West Palm Beach, Fla.
San Diego, Calif.
San Luis Obispo, Calif.
Laredo, Tex.
Brownsville, Tex.
McAllen, Tex.
Monmouth, NJ

To view the study, the complete list of 200 metros, and a separate ranking of 96 smaller metros, visit our Web site at www.milkeninstitute.org.

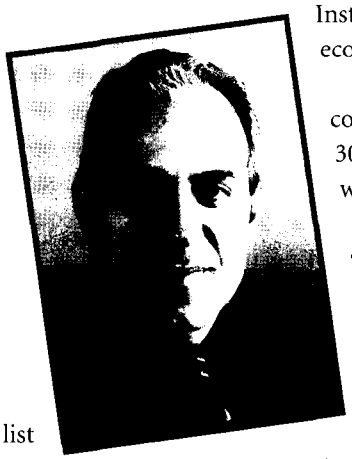
HEALTH CARE AND A HEALTHY ECONOMY

Cities and regions with the greatest density of health care resources could be big economic winners in the decades ahead. According to a new study from the Milken Institute, "America's Health Care Economy," cities at the top of this list are Boston, New York, Philadelphia, Chicago, Los Angeles and Washington, D.C.

Each of these metro areas has a major stake in health care, from hospitals to pharmaceuticals to biotechnology, which pumps hundreds of millions of dollars into its local economy and sustains tens of thousands of jobs.

"The health care sector provides a huge economic base for some of these regions, and it promises to be a major global economic force in the years ahead," says Ross DeVol, the Institute's director of regional economics.

To view the study and the complete list of more than 300 U.S. metros, check out www.milkeninstitute.org.



TOP SPOT FOR FORMER GORE AIDE

The Milken Institute has named Gregory C. Simon as president of its latest initiative, the Center for Accelerating Medical Solutions (CAMS).

Established this spring with a board of directors comprised of Nobel laureates in economics and medicine as well as distinguished leaders of health care, business and journalism, CAMS is an independent, nonpartisan organization that will examine the entire medical research process, looking for ways to accelerate scientific discovery and to

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shorten the path from laboratory to clinic.

Simon joins CAMS after being principal at Infotech Strategies, a Washington, D.C. consulting firm with special expertise in health technology, biotech, education technology and communication technology. Prior to that, he was CEO of Simon Strategies/Mindbeam, a consulting firm focused on clients in biotechnology, health care and information technology. Simon was the chief domestic advisor to Vice President Al Gore from 1993 to 1997, with a focus on economic, science and technology policy.

CAMS will have its own offices in Washington, D.C. and operate independently, though under the auspices of the Milken Institute. For more information on CAMS, see www.fastercures.org.

NEW STUDY HIGHLIGHTS NEBRASKA'S TECHNOLOGY AND SCIENCE POSITION

A new report uses the Milken Institute's Technology and Science Index to compare the State of Nebraska with its regional peers as well as with national leaders. The index uses 77 indicators in five categories to measure how well a state performs in today's knowledge-based economy. To view "Nebraska's Position in Technology and Science," visit www.milkeninstitute.org.

GLOBAL CONFERENCE SET FOR APRIL 26-28, 2004

The annual Milken Institute Global Conference, where the world's leading business, economic, government and academic talent comes together to assess where the world is headed, will take place April 26-28, 2004, at the Beverly Hilton Hotel in Los Angeles. For information, call 310-570-4605.

DAVID SMITH

Yes, the guy on the magazine spine is Karl Heinrich Marx (1818-83). Wannabe philosophy professor, sometime journalist (for the *New York Daily Mail*) and full-time political refugee from Germany, Marx is, of course, best known for ideas used to rationalize the excesses of the organized crime syndicates run by Lenin, Stalin and Mao.

His three-volume treatise *Capital* is, shall we say, a tough read. Suffice it to say that he built a theory of political economy that was heavily influenced by the great classical economists, Adam Smith and David Ricardo, but bypassed by the less ambitious, better equipped theorists who collectively produced the neoclassical synthesis now taught in Econ 101.

The Communist bosses called him their own. But his enduring intellectual impact has arguably been in history and sociology, where his analysis of human dynamics in terms of social classes exerts influence to this day.

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According to the International Organization for Migration, 2.9 percent of the world's population consists of people living away from the country in which they were born – double the percentage of four decades earlier.

Is that good news or bad news? Depends on how you look at it. Most of the movement was almost certainly motivated by economic push and pull. But the welcome the migrants get plainly varies – consider the difference between Canada or Australia on the one hand, and Saudi Arabia and Germany on the other.

What is clear, though, is that the money they send home has made a world of difference for families and communities. Think Jordan, El Salvador or the Dominican Republic. And in some cases, it has fundamentally altered the prospects for economic development. Think India or Mexico.

FOREIGN-BORN, YEAR 2000

COUNTRY	NUMBERS (MILLIONS)	% POPULATION
USA	35.0	12
Russia	13.3	9
Germany	7.3	9
Ukraine	6.9	14
France	6.3	11
India	6.3	1
Canada	5.8	19
Saudi Arabia	5.3	26
Australia	4.7	24
Pakistan	4.2	3

RECORDED MIGRANT REMITTANCES, YEAR 2000

COUNTRY	REMIT. ($ BILLIONS)	% GDP
Jordan	1.9	22
Yemen	1.4	14
El Salvador	1.8	13
Jamaica	0.8	11
Dominican Republic	1.8	9
Ecuador	1.1	8
Sri Lanka	1	7
Morocco	2.1	7
Bangladesh	2	4
Egypt	3.8	4

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In this issue

THOMAS HAZLETT
On the FCC's dithering over spectrum rights.
Sell the airwaves, already.

FRANK LICHTENBERG
On the bonanza in pharmaceuticals.
Better living through chemistry.

MARTIN CAMPBELL-KELLY
On protecting the intellectual property in software.
Patents aren't such a bad idea, after all.

MICHAEL BERNICK
On employing the disabled.
It's worth the hassle.

BARRY EICHENGREEN
On prospects for the euro.
Monetary union is a good idea. Really.

ANDREW ZIMBALIST
On the television sports monopoly.
There oughta be a law.

RAGHURAM RAJAN AND LUIGI ZINGALES
On the enemies of capitalism.
Eternal vigilance is the price of free markets.

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